KILIFI COUNTY INTERGRATED SMART SURVEY REPORT

AUGUST 2023

ACKNOWLEDGEMENT

The Kilifi County Integrated SMART survey of 2023 was made possible due to coordinated efforts by various nutrition specific and nutrition sensitive actors. The Department of Health Services, Kilifi County acknowledges the following partners due to their contribution in the entire survey process:

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ABBREVIATIONS AND ACRONYMS

BCC:	Behavior Change Communication
BCG	Bacillus Calmette–Guérin
CI	Confidence Interval
CLTS	Community Led Total Sanitation
CNC	County Nutrition Coordinator
GAM	Global Acute Malnutrition
HFA	Height-for-Age
HHs	Households
HINI	High Impact Nutrition Interventions
ICCM	Integrated Community Case Management of Acute Malnutrition
ILRI	Integrated Livestock Research Institute
IMAM	Integrated Management of Acute Malnutrition
IPs	Implementing partners
KRCS	Kenya Red Cross Society
MDD-W	Minimum Dietary Diversity-Women
MOA	Ministry of Agriculture
MOH	Ministry of Health
MOW	Ministry of Water
MUAC	Mid Upper Arm Circumference
NDMA	National Drought Management Authority
NIWG	Nutrition Information working group
ODK	Open Data Kit
OPV	Oral Polio Vaccine
ORT	Oral Rehydration Therapy
PPS	Probability Proportional to Population Size
SAM	Severe Acute Malnutrition
SFP	Supplementary Feeding Program
UNICEF	United Nations Children's Fund
WFA:	Weight for Age
WFH:	Weight-for-Height
WFP :	World Food Program
WHO:	World Health Organizations

EXECUTIVE SUMMARY

Kilifi County department of health in collaboration with nutrition sector partners and Nutrition information technical working groups carried out a SMART survey in the entire County June 2023.

The main objective of the survey was to determine the prevalence of malnutrition among the children aged 6- 59 months old, pregnant and lactating mothers in Kilifi County. Specifically the survey aimed at determining the nutrition status of children 6 to 59 months, the nutritional status of women of reproductive age (15-49 years) based on maternal mid upper arm circumference, immunization coverage; measles (9-59 months), OPV1/3 and Vitamin A for children aged 6-59months. The survey also was meant to determine deworming coverage for children aged 12 to 59 months, the prevalence of common illnesses as well to assess maternal and child health care practices, water, sanitation and hygiene practices and prevailing food security situation in the County.

Methodology

The survey was cross sectional and descriptive by design. Standardized Monitoring and Assessment on Relief and Transition methodology was be adopted in the study. The study applied quantitative approach. Two stage sampling was used in the survey. The first stage involved random selection of clusters from the sampling frame based on probability proportion to population size (PPS). Emergency Nutrition Assessment (ENA) for Standardized Monitoring for Assessment for Relief and Transition (SMART) January 11 2020 was used in calculation of sample size. A minimum of 672 households were required for the survey. The second stage sampling involved selection of households using simple random sampling method. From the list the survey teams randomly selected 14 households where they administered household questionnaire (in all households) and anthropometric, morbidity and immunization questionnaire in household with children aged 6 to 59 months. Anthropometric data processing was done using ENA software version 2020 (January). The ENA software generated weight-for-height, height-for-age and weight-for-age Z scores to classify them into various nutritional status categories using WHO standards and cut-off-points. All the other quantitative data were analyzed in Ms. Excel and the SPSS (Version 25) computer package.

Summary of the findings

Out of the planned 48 clusters, all were visited and a total of 650 households were interviewed. 4169 members of the population were sampled, out of which 46.8% were male while 53% were female.603 children under 5 years old were assessed and their anthropometric measurements taken. Overall data quality of the survey was rated at 2%, which is acceptable. The table below is a summary of the findings

Nutrition Status of Children 6-59 months			
Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema)			
Indicator	**All** n=597	**Boys** n=311	**Girls** n=286
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(37) 6.2 % (4.4 - 8.7 95% C.I.)	(19) 6.1 % (3.9 - 9.4 95% C.I.)	(18) 6.3 % (4.0 - 9.7 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(33) 5.5 % (3.8 - 8.0 95% C.I.)	(18) 5.8 % (3.6 - 9.1 95% C.I.)	(15) 5.2 % (3.2 - 8.5 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(4) 0.7 % (0.3 - 1.7 95% C.I.)	(1) 0.3 % (0.0 - 2.4 95% C.I.)	(3) 1.0 % (0.3 - 3.1 95% C.I.)
Prevalence of GAM based on MUAC			
	All n = 603	**Boys** n = 315	**Girls** n = 288
Prevalence of global malnutrition (< 125 mm and/or oedema)	(17) 2.8 % (1.8 - 4.5 95% C.I.)	(2) 0.6 % (0.2 - 2.6 95% C.I.)	(15) 5.2 % (3.1 - 8.5 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(13) 2.2 % (1.3 - 3.6 95% C.I.)	(2) 0.6 % (0.2 - 2.6 95% C.I.)	(11) 3.8 % (2.1 - 6.7 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(4) 0.7 % (0.3 - 1.7 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(4) 1.4 % (0.5 - 3.5 95% C.I.)
Prevalence of combined GAM and SAM based on WHZ and MUAC cut off's (and/or oedema) and by sex			
	All n = 603	**Boys** n = 315	**Girls** n = 288
Prevalence of combined GAM (WHZ <-2 and/or MUAC < 125 mm and/or oedema)	(45) 7.5 % (5.5 - 10.0 95% C.I.)	(21) 6.7 % (4.3 - 10.1 95% C.I.)	(24) 8.3 % (5.6 - 12.2 95% C.I.)
Prevalence of combined SAM (WHZ < -3 and/or MUAC < 115 mm and/or oedema	(6) 1.0 % (0.5 - 2.1 95% C.I.)	(1) 0.3 % (0.0 - 2.3 95% C.I.)	(5) 1.7 % (0.8 - 3.9 95% C.I.)
Prevalence of underweight based on weight-for-age z-scores by sex			
	All n = 597	**Boys** n = 313	**Girls** n = 284
Prevalence of underweight (<-2 z-score)	(118) 19.8 % (15.8 - 24.5 95% C.I.)	(62) 19.8 % (15.7 - 24.6 95% C.I.)	(56) 19.7 % (14.7 - 25.9 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(98) 16.4 % (12.9 - 20.7 95% C.I.)	(50) 16.0 % (11.8 - 21.2 95% C.I.)	(48) 16.9 % (12.6 - 22.2 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(20) 3.4 % (2.1 - 5.3 95% C.I.)	(12) 3.8 % (2.1 - 7.0 95% C.I.)	(8) 2.8 % (1.5 - 5.1 95% C.I.)
Prevalence of stunting based on height-for-age z-scores and by sex			
	All n = 583	**Boys** n = 303	**Girls** n = 280
Prevalence of stunting (<-2 z-score)	(188) 32.2 % (27.7 - 37.1 95% C.I.)	(99) 32.7 % (27.6 - 38.2 95% C.I.)	(89) 31.8 % (25.2 - 39.2 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(137) 23.5 % (20.0 - 27.4 95% C.I.)	(74) 24.4 % (19.9 - 29.6 95% C.I.)	(63) 22.5 % (17.3 - 28.7 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(51) 8.7 % (6.3 - 11.9 95% C.I.)	(25) 8.3 % (5.8 - 11.7 95% C.I.)	(26) 9.3 % (6.0 - 14.1 95% C.I.)
Mortality Rates			
Mortality Findings			
Crude Death Rate (95% CI)	**Design Effect**		
0.10(0.04-0.26)	1		
Under-five Death Rate (95%CI)			
0.15(0.02-1.27)	1.01		
Cause and location of deaths			
Cause of Death	%	**Location of Death**	%

Unknown	**0.0**	In Current location	**75%**
Illness	**75%**	Other (Hospital)	**25%**
Maternal Nutrition			
Nutrition status			
Indicator	**Description**	**Percentage (%)**	
MUAC <21	WRA	4.57%	
MUAC >21-<23	WRA	15.75%	
MUAC >23	WRA	79.69%	
MUAC <21	PLW	4.48%	
MUAC >21-<23	PLW	14.55%	
MUAC >23	PLW	80.97%	
IFAS Consumption among ANC mothers	<90 Days	15.20%	
	>90 Days	84.70%	
Food Security Indicators			
Food Consumption Score	**HOH**	**PERCENT**	
Acceptable FCS (>35.5)	615	94.62%	
Borderline FCS (21.5-35.0)	26	4.00%	
Poor FCS (0-21)	9	1.38	
Coping strategy index	**Mean score**	**Severity score**	**Weighted**
Rely on less preferred and less expensive foods	4.05	1	4.05
Borrow food or rely on help from a friend or relative	2.43	2	4.86
Limit portion size at mealtimes	3.78	1	3.78
Restrict consumption by adults in order for small children to eat	3.23	3	9.69
Reduced number of meals eaten in a day	4.1	1	4.1
Water, Sanitation and Hygiene			
Indicator	**Description**	**Percentage (%)**	
Main source of drinking water	Piped water system	51%	
Trekking distance to water source	Less than 500M (less than 15 minutes)	80%	
Types of water treatment	Chemicals (Chlorine, Pur, Water Guard)	85%	
Queueing for water	Less than 30 min	92%	
Handwashing facilities	Mobile objects	85%	
Handwashing instances	After taking child to the toilet	100%	
Sanitation Facilities Ownership and accessibility	Pit latrine	44%	
Type of flushing Facility	Flush to septic tank	87%	
Infant and Young Child Nutrition			
Prevalence of Key complementary feeding practice	Proportion of 6–8-month-old who received solid, semi solid or soft foods in the previous day (N=31)	35.6%	
Minimum Dietary Diversity	Percentage of children 6-23 months who received who received foods from at least 4 food groups (N=211)	33.6%	
Minimum Meal Frequency (MMF)	% of both breastfed and non-breastfed 6-23 months	68.7%	

	of age who received foods the minimum times or more (N=211)		
Minimum Acceptable Diet (MAD)	children 6-23 months of age who receive a minimum acceptable diet (N=211)	24.1%	
Access And Utilization Of Health And Nutrition Services			
Prevalence of main Illnesses(symptoms) based on 2-weeks recall	**ARI/Cough/Flu**/reported Pneumonia	**28.7%**	
	Fever/Chills/reported Malaria	**10.9%**	
	Watery Diarrhea (3 or more loose stools in a day)	**9.3%**	
	Others (Skin infections/Eye infections/Boils/Ring worms etc)	**3.3%**	
Vitamin A supplementation-VAS Coverage			
Indicator	**No. of times**	**Percentage (%)**	
Vas coverage 6-11 months	Once	89%	
VAS coverage 12-59 months	Once	49%	
VAS coverage 12-59 months	At least twice	35%	
VAS coverage 6-59 months	twice	41%	
Deworming coverage	Once	54.6%	
	Twice	29.3%	
Immunization (OPV1, OPV3, Measles)			
Antigens	**Means of verifications**	**Percentage (%)**	
OPV 1	Card	85%	
OPV3	Card	83%	
1st dose Measles at 9 months	Card	80%	
2nd dose Measles at 18 months	Card	70%	
BCG	Presence of scar	99.5%	

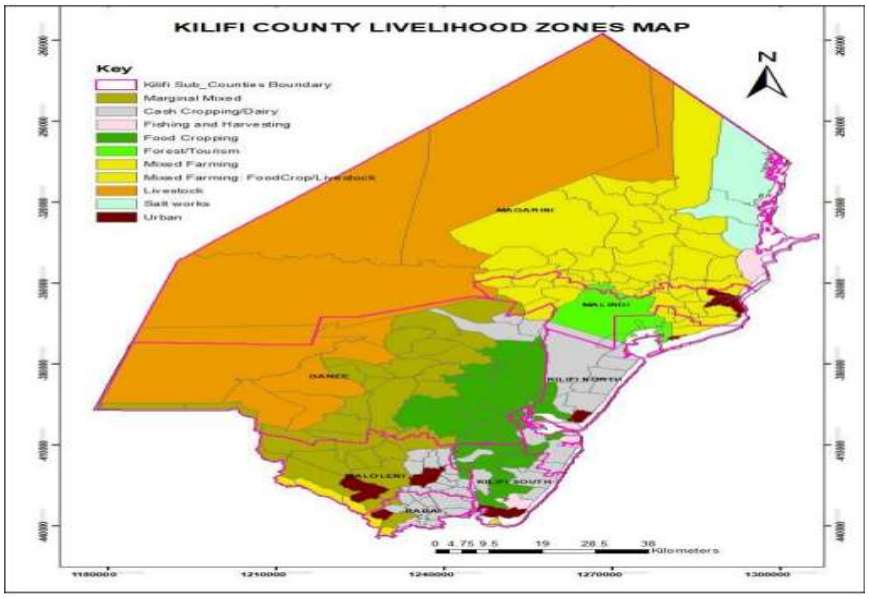
CHAPTER ONE

1.1 Background Information

Kilifi is one of the six counties in the coast region of Kenya. The County covers an area of 12,370.8 km2 and has a population of 1,453,787 people (KNBS,2019) of which 202,076 (13.9%) are children under five years old. Administratively, the County is divided into seven (7) sub counties namely: Malindi, Magarini, Ganze, Rabai, Kaloleni, Kilifi South and Kilifi North.

It has four main livelihood zones: Marginal Mixed Faming (44%), Cash cropping /Dairy (22%), Mixed Farming 11% and Ranching (2%). Other livelihood zones include: Fishing and Mangrove Livelihood (3%), Formal employment (14%) and Forest/Tourism and Casual labor (2%) each (January 2023 SRA.

The County has 150 functional GOK facilities and 255 established Community health units



1.2 Survey justification

The February short rains assessment (SRA) classified the food security situation in the County as stressed (IPC 2). 788,668 people (50% of the total population) were in IPC 2(stressed) while another 78,867(3% of the total population) were in IPC 3(in crisis).

The food security prognosis showed the likelihood of the situation deteriorating in the county with an estimated 15% (236,600) likely to be in IPC 3(crisis).

The year 2023 generally recorded higher admission trends for both severe acute malnutrition (SAM) and moderate acute malnutrition (MAM) in both the OTP and SFP programs.

Previous food security assessments have recommended the need for a SMART survey to support IPC analysis and classification.

The last SMART survey was conducted in 2016 hence the need for recent data to inform the nutrition situation in the county and interventions.

The MIYCN KAP Survey of 2017 revealed sub optimal infant feeding practices, and exclusive breastfeeding rates were below 80%. Complementary feeding practices of children are not optimal as the Minimum Acceptable Diet for children aged 6-23 months is 25.1%, MMF is 65% and MDD is 35.5% (MIYCN KAPB Survey, 2017)

1.3 Survey Objectives

1.3.1 Overall Objective

The main objective of the survey was to determine the prevalence of malnutrition among children aged 6 to 59 months and women of reproductive age (15-49 years) in Kilifi County.

1.3.1 Specific Objectives

1.To estimate the current prevalence of acute malnutrition in children aged 6 – 59 months

2.To determine the morbidity rates among children aged 6-59 months.

3.To determine the immunization coverage for Measles, BCG, and Oral polio vaccines (OPV1 and 3) for children aged 6-59 months.

4.To determine the coverage for deworming (12-59 months), zinc supplementation for diarrhea, and vitamin A supplementation among children 6-59 months.

5.To estimate the nutritional status of women of reproductive age 15-49 years using MUAC measurements

6.To collect information on household food security, water, sanitation, and hygiene practices.

7.Establish the age for introduction of solid, semi-solid or soft foods for children aged 6-23 months in Kilifi County

8. Determine the Minimum Dietary Diversity for children aged 6-23 months

9. Determine the Minimum Meal Frequency for children aged 6-23 months

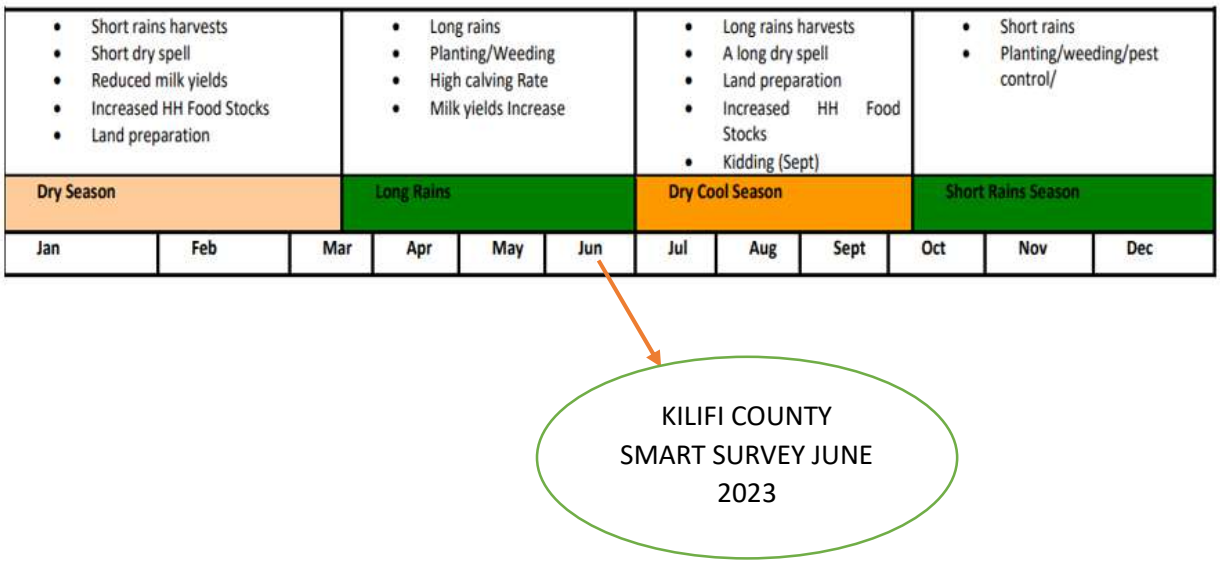
10. To establish the Minimum Acceptable Diet for children aged 6-23 months

11. To estimate the Crude Mortality Rate and Under 5 Mortality Rates

1.4 Survey Timing

Kilifi county smart survey was carried out during the long rains season in June 2023.

The integrated nutrition SMART survey was conducted in line to seasonal assessment and survey findings were used to classify and inform on outcome indicators (nutrition status) during ling rain assessment in July 2023.



CHAPTER TWO
METHODOLOGY

2.1 Type of survey

The survey encompassed the entirety of Kilifi County and was executed using the SMART (Standardized Monitoring and Assessment of Relief and Transitions) methodology. Simultaneously, data on Water Sanitation and Hygiene (WASH), Food Security and Livelihood (FSL), Morbidity and Causes, immunization, deworming, and supplementation were collected. In addition, a comprehensive review of existing surveillance data sources, including NDMA monthly bulletins, the Health Information System (KHIS), and prior assessments, was conducted prior to the survey.

The survey protocol underwent a rigorous validation process before data collection commenced. It was presented to the County steering Group, County nutrition technical working group and Technical Working Group members and the National Nutrition Information Working Group (NITWG).

2.2 Sample size calculation

The determination of the sample size was facilitated using the Emergency Nutrition Assessment (ENA) software version 2020. This process factored in various parameters to arrive at a sample size of 672 households and 363 children.

2.2.1Sample size calculation for anthropometry using ENA

The considerations guiding the sample size calculation are elucidated in Table , which outlines the key factors taken into account during this crucial step.

Table 1: Sample size calculation for MORTALITY using ENA

Parameters for Anthropometry	Value	Assumptions based on context
Estimated Prevalence of GAM (%)	7.2	Based on 2022, Kenya Demographic and Health Survey, where the GAM was 7.2%.
± Desired precision	3.4%	According to SMART guidelines based on previous GAM

Design Effect	1.5	DEFF for estimated prevalence from KDHS could not be retrieved, therefore it is recommended to use 1.5 to cater for heterogeneity effect within the survey population
Children to be included	**363**	Calculation by ENA for SMART software
Average HH Size	4.8	From County Integrated Development Plan and KNBS Census Report (2019)
% Children under-5	13.9	From the County Integrated Development Plan
%Non-response Households	3 %	Based on experience from previous surveys (SMART)
Households to be included	622	Calculation by ENA for SMART software

Parameters for Anthropometry	Value	Assumptions based on context
Estimated death rate per 10000/day	0.44	No available data on death rate, thus the rate was adopted from SMART Manual V 2.0 for Sub Saharan Context Standard Rate
± Desired precision	0.3%	According to SMART guidelines, based on estimated death rate. It also suits the survey objective of assessing mortality indicator
Design Effect	1.5	DEFF for estimated prevalence from KDHS could not be retrieved, therefore it is recommended to use 1.5 to cater for heterogeneity effect within the survey population
Population to be included	3129	Calculation by ENA for SMART software

Average HH Size	4.8	From County Integrated Development Plan and KNBS Census Report (2019)
Recall Period	98 days	Based on 23rd March in reference to Beginning of Ramadhan, which is memorable to Kilifi Communities, up to the mid-interval of survey data collection 28th June 2023
%Non-response Households	3 %	Based on experience from previous surveys (SMART)
Households to be included	672	Calculation by ENA for SMART software

2.3 Survey Design

The survey was meticulously structured as a cross-sectional and descriptive study. It was rooted in the methodology of Standardized Monitoring and Assessment of Relief and Transition (SMART), strategically chosen for its relevance. Embracing a quantitative approach, the study was conducted with precision and thoroughness.

2.4 Sampling Methods

The survey applied two stage cluster sampling using SMART methodology.

First Stage sampling

The first stage involved selection of clusters from a sampling frame (list of all updated clusters/villages with their respective populations). All villages that are accessible were included in the initial sample selection with each village considered a cluster.The clusters were sampled with probability proportional to size. All villages along with their respective populations were entered into the ENA software (Jan 11th,2020) and clusters selected accordingly. A sample size of 672 households obtained using ENA software was used as the survey sample size. Based on logistical considerations, it was possible to administer 14 questionnaires per day translating to a minimum of 48 clusters.

Second stage sampling

Simple random sampling was used for household selection. A list of households in a selected cluster was used as sampling frame. With assistance from the village elders, every household was listed to produce a sampling frame. In every cluster (village), 14 households were selected.Within sampled households, all children 6-59 months fitting the inclusion criteria were measured.

2.4.1 Selection of Household

A household was defined as a dwelling or multiple dwellings whose inhabitants ate from the same "cooking pot". In collaboration with village chiefs and elders, an up-to-date roster of households in the villages was developed. This process involved the Sub County nutritionist and the County health record information officer. Abandoned households were deliberately omitted from this list.

Employing a table of random numbers, 14 households were selected in a random manner from the updated household lists. In instances where a village boasted a considerable number of households, a segmentation approach was adopted. Subsequently, one segment was chosen at random to effectively represent the entire village.

2.4.2 Selection of Children for Anthropometry

The sample encompassed all children aged 6-59 months residing within the chosen households. The primary caregiver of the respective index child/children served as the respondent. In cases of temporary absence of the child and/or caregiver, the survey team revisited the household to ensure data collection at a suitable time.

2.4.3 Selection of women for determination of nutrition status

The study enlisted the mother of the index child within the reproductive age range of 15-49 years, along with any other household member falling within this age category. Subsequently, their Mid-Upper Arm Circumference (MUAC) measurements were recorded as part of the study procedure.

2.5 Case Definition

In all selected households, all children 6-59 months were included in the anthropometric survey. The age of the children was determined using a local historical and seasonal calendar of events and birth record if available. If there were no children 6-59 months in the household, the household was still interviewed for WASH and Food Security and Livelihoods (FSL). Data on, morbidity, WASH and food security was collected by recall.

The following case definitions were used in the assessment:

- **Household**: Group of persons who live together under the same roof and eat from the same pot for at least a period of 3 months preceding the assessment. In homes with multiple spouses, those living and eating in different houses are considered as separate households. Wives living in different houses but eating from the same pot are considered as one household.
- **Head of household:** One who controls and makes key decisions on household resources (livestock, assets, income, and food), health and social matters for and on behalf of the household members
- **Respondent:** The person responsible for food preparation on the recall day. For the child, this refers to the mother or caregiver.
- **Diarrhea:** having three or more loose or watery stools per day
- **Measles vaccination**: a jap in the upper arm given to children after 9 months and 18 months of age at health clinics or by mobile health teams.
- **Meal**: food served and eaten at one time (excluding snacks) and includes one of the three commonly known: - breakfast, lunch and supper/dinner
- **Oedema**: Swollen limbs leaving depression 3 seconds after pressing on both feet (bilateral)

2.6 Survey Team

A multi-stakeholder approach was adopted to ensure comprehensive engagement in the proposed Kilifi County SMART survey. This approach encompassed county government line ministries, led by the Ministry of Health (MoH), the National Drought Management Authority (NDMA), World Vision, Kenya Red Cross Society, UNICEF, and active community members. Each survey team comprised two enumerators and one team leader. The coordination and team leadership roles were assumed by personnel from MoH and partner organizations. Enumerators were selected based on their proven track record and experience in SMART surveys.

2.6.1 Survey team training and supervision

A rigorous four-day training was conducted to equip the survey teams with the requisite skills. The training encompassed diverse subjects such as sampling methods, anthropometric measurements,

effective interviewing techniques, accurate completion of questionnaires, and utilizing tablets for capturing photos of cases with Oedema. The training also included both standardization tests and a pilot test phase. During standardization, each enumerator took anthropometric measurements for 10 children twice to ensure uniformity and accuracy. The subsequent pilot test involved each team completing three questionnaires in selected villages that were deliberately excluded from the sampled clusters. This methodically structured pilot test aligned with the established norms of a standard SMART survey.after the pre testing, a debriefing session with the survey team was held where difficulties that arose were addressed.

2.7 Data Collection

The data collection phase spanned 5 days for 9 teams, and a duration of 6 days for two teams, commencing from June 25th and concluding on July 1st, 2023. This effort was carried out under the watchful supervision of two CHMT (County Health Management Team) members, the County Nutrition coordinator, staff from NITWG and Nutrition staff hailing from World vision and Kenya Red Cross.

Throughout the data collection process, strict adherence to field procedures was maintained. This included meticulously selecting eligible households, identifying children for anthropometric measurements, and pinpointing suitable respondents for interviews.

Survey teams initiated their work by reporting to the area chief or village elder for their respective assigned clusters or villages. They updated the list of households and were then assigned a village guide. Employing the use of random numbers, households to be visited were methodically chosen. Guided by the village guide, teams navigated through the village, visiting the selected households. Upon the culmination of each day's data collection, all teams were able to electronically submit their acquired data. A central data manager remained available to receive, review, export, filter, and provide feedback to the teams. This feedback loop was facilitated through the field supervisor or a dedicated WhatsApp group established for the survey.

2.8 Variables Measured

Age: The exact age of the child was recorded in months. Calendar of events, health or baptismal cards and birth certificates were used to determine age. **Weight:** Children were measured using a digital weighing scale

Height: Recumbent length was taken for children less than 87cm or less than 2years of age while height measured for those greater or equal to 87cm or more than2 years of age.

Weight for height : This was estimated from a combination of the weight for height (WFH) index values (and/or edema) and by sex based on WHO standards 2006. This index was expressed in WFH indices in Z-scores, according to WHO 2006 reference standards. Z-Score:

- Severe acute malnutrition is defined by WFH < -3 SD and/or existing bilateral edema,
- Moderate acute malnutrition is defined by WFH < -2 SD and >-3 SD and no edema,
- Global acute malnutrition is defined by WFH < -2 SD and/or existing bilateral edema.

MUAC: Mid Upper Arm Circumference (MUAC) was measured on the left arm, at the middle point between the elbow and the shoulder, while the arm was relaxed and hanging by the body's side. MUAC was measured to the nearest Cm. MUAC measurements were taken for children 6-59months of age and for women in the reproductive age (15-45 years of age).

Table 2: MUAC Guideline

MUAC Guideline	**Interpretation**
Children 6-59 months	
MUAC <115mm and/or bilateral Edema	Severe acute malnutrition
MUAC >=115mm and <125mm (no bilateral edema)	Moderate acute malnutrition
MUAC >=125mm and <135mm (no bilateral Edema)	Risk of malnutrition
MUAC > 135mm (no bilateral Edema)	Adequate nutritional status
Women of Reproductive Age (15-49 years)	
MUAC <21-23cm	At Risk of malnutrition
MUAC <21cm	Maternal Acute Malnutrition

Bilateral oedema: Assessed by the application of normal thumb pressure for at least 3 seconds to both feet at the same time. The presence of a pit or depression on both feet was recorded as oedema present and no pit or depression as oedema absent.

Morbidity: Information on two-week morbidity prevalence was collected by asking the mothers or caregivers if the index child had been ill in the two weeks preceding the survey and including the day of the survey. Illness was determined based on respondent's recall and was not verified by a clinician.

Immunization status: For allchildren6-59months, information on BCG, OPV1, OPV3 and measles vaccinations status was collected using health cards and recall from caregivers. When estimating measles coverage, only children 9months of age or older were taken in to consideration as they are the ones who were eligible for the vaccination.

Vitamin A supplementation status: For all children6-59monthsofage, information on Vitamin A supplementation in the 6months prior to the survey date was collected using child health and immunization campaign cards and recall from caregivers.

Iron-Folic Acid supplementation: For all female caregivers, information was collected on IFA supplementation and number of days (period) they took IFA supplements in the pregnancy of the last birth that was within 24 months.

De-worming status: Information was solicited from the caregivers as to whether children1259 months of age had received de-worming tablets or not in the previous one year. This information was verified by health card where available.

Food security status of the households: Food consumption score, Minimum dietary diversity score women source of predominant foods and coping strategies data was collected.

Household water consumption and utilization: The indicators used were main source of drinking and household water, time taken to water source and back, cost of water per 20-litre jerry-can and treatment given to drinking water.

Sanitation: Data on household access and ownership to a toilet/latrine, occasions when the respondents wash their hands were also obtained.

Mosquito nets ownership and utilization: Data on the household ownership of mosquito nets and their utilisation was collected

Minimum dietary diversity score women (MDD-W): A 24 hour food consumption recall was administered to all women of reproductive Age(15-49 years).All foods consumed in the last 24 hours were enumerated for analysis. All food items were combined to form 10 defined food groups and all women consuming more at least five of the ten food groups were considered to meet the MDD-W.

Household food consumption score (FCS). Data on the frequency of consumption of different food groups consumed by a household during 7 days before the survey was collected. The Table below shows WFP corporate thresholds for FCS used to analyse the data.

Table 3: FCS thresholds

Food Consumption Score	Profile
<21	Poor
21.5-35	Borderline
>35	Acceptable

Coping strategy index (CSI): Data on the frequency of the five reduced CSI individual coping behaviours was collected. The five standard coping strategies and their severity weightings used in the calculation of Coping Strategy Index are:

1. Eating less-preferred foods (1.0),
2. Borrowing food/money from friends and relatives (2.0),
3. Limiting portions at mealtime (1.0),
4. Limiting adult intake (3.0), and
5. Reducing the number of meals per day (1.0)

CSI index per household was calculated by summing the product of each coping strategy weight and the frequency of its use in a week (no of days).

2.8.1Data Entry and Quality Checks

The survey embraced mobile technology to streamline data collection, with the utilization of Open Data Kit (ODK). For this purpose, a standardized SMART questionnaire form was crafted on KOBO toolbox and subsequently downloaded onto the ODK Collect application for the Android operating system, operational on tablet devices. This approach facilitated data submission and storage, enabling teams to transmit information to configured servers for subsequent analysis. The tablet questionnaires were diligently examined by supervisors to ensure completeness, consistency, and accuracy. Feedback was provided to enhance data collection as the survey progressed. At the close of each day, tablet synchronization with the server occurred, leading to the upload of collected data.. On a daily basis, the SMART plausibility report was generated to swiftly identify any anomalies in anthropometric data collection. Such anomalies encompassed flags and digit preferences associated with age, height, and weight measurements, thereby elevating the quality of collected anthropometric data throughout the survey's duration. Incorporating a feedback loop, teams received guidance each morning before venturing into the field

2.8.1 Data processing and analysis

Anthropometric data entry and processing underwent completion through the ENA for SMART software, version dated January 9th, 2023. This phase involved adhering to the data cleaning and flagging procedures according to the World Health Organization Growth Standards (WHO-GS). The primary objective was to identify outliers, a process that effectively ensured data integrity and facilitated the exclusion of discrepant measurements from the anthropometric analysis .On a daily basis, the SMART plausibility report was generated to swiftly identify any anomalies in anthropometric data collection. Such anomalies encompassed flags and digit preferences associated with age, height, and weight measurements, thereby elevating the quality of collected anthropometric data throughout the survey's duration.

Employing the SMART/ENA software, weight-for-height, height-for-age, and weight-for-age Z scores were generated, enabling the classification of subjects into distinct nutritional status categories. This classification relied on WHO standards and their corresponding cut-off points. In tandem with this, supplementary data pertaining to children aged 6-59 months, women aged 15-49 years, Water Sanitation and Hygiene (WASH) indicators, as well as food security indicators,

were subjected to meticulous cleaning and analysis. These analytical endeavors were conducted using a combination of tools including Epi-Info, ENA Epi Info, and Microsoft Excel.

The outcomes of this survey were meticulously compared against the established WHO standard cut-off points, thereby affirming the findings against internationally recognized benchmarks.

For anthropometric data analysis, the ENA for SMART software, January 2015 version (updated on 7th July 2015), was harnessed. Meanwhile, Microsoft Excel played a pivotal role in entering and analyzing all other datasets. This comprehensive approach underscored the survey's commitment to data accuracy, integrity, and effective analysis.

2.9 Limitations

Accurately ascertaining the precise age of certain children posed a significant challenge, particularly when relying on the calendar of events. The primary hurdles stemmed from the accuracy of recall, leading to recall bias. Additionally, in certain villages, respondents encountered difficulty in connecting with certain events.

Inclement weather, particularly heavy rainfall, adversely impacted the road conditions, resulting in arriving to the sampled households very late and also leaving at night.

2.10 Ethical Considerations

Comprehensive information was communicated to local authorities regarding the survey, encompassing its purpose, objectives, data collection methods, target demographic, and procedural details. Prior to participation, verbal consent was actively sought from all adult participants and parents/caregivers of eligible children involved in the survey. Importantly, the autonomy of caregivers in deciding to participate or withdraw was fully respected throughout the process. Furthermore, stringent measures were implemented to ensure the privacy and confidentiality of both survey respondents and the data they provided.

3.0 SURVEY RESULTS

3.1 Household Demographics

3.1.1 Anthropometric results (based on WHO standards 2006):

Acute malnutrition is defined as undernutrition that results in sudden weight loss or oedema. Children with acute nalnutrition have a low weight compared to their height, in reference to a standard child of equal age, according to the WHO Growth Standards. Acute malnutrition can be further classified into Modertae Acute Malnutrition where a child has a weight for height Z-score of <-2 SD and/or a Mid-Upper Arm Circumference of less than 125mm, and Severe acute malnutrition where a child has a weight for height z-score of <-3SD and/or Mid-Upper Arm Circumference of less than 115mm.

For the survey, a total of 603 children 6-59 months old were assessed using the following anthropometric indicators: Weight for Height, MUAC, Weight for age and Height for Age. 52.2% were male while 47.8% were female. The age and gender distribution is as stipulated in Table 3.1 . Analysis of these indicators was based on WHO standards for 2006.

Table 4: Distribution of age and sex of sample

	Boys		Girls		Total		Ratio
AGE (mo)	**no.**	**%**	**no.**	**%**	**no.**	**%**	**Boy:girl**
6-17	62	44.6	77	55.4	139	23.1	0.8
18-29	88	60.7	57	39.3	145	24.0	1.5
30-41	59	48.4	63	51.6	122	20.2	0.9
42-53	65	50.0	65	50.0	130	21.6	1.0
54-59	41	61.2	26	38.8	67	11.1	1.6
Total	315	52.2	288	47.8	603	100.0	1.1

Figure 3.1: Population age and sex pyramid

3.1.2 Prevalence of acute malnutrition based on weight for height by sex

The analysis of acute malnutriton was based on measurements taken from 597 children, of which 311 were boys and 286 were girls. This analysis revealed that Kilifi County has a Global Acute Malnutrition level of 6.2%(4.4 - 8.7 95% C.I.), classified as Alert (IPC AMN Classification). The Severe Acute Malnutriiton rate was as 0.7% (0.3 - 1.7 95% C.I.). There was no significant

difference in GAM between boys (6.1%) and girls (6.3%). The summary of these findings are stipulated in Table 3.2.

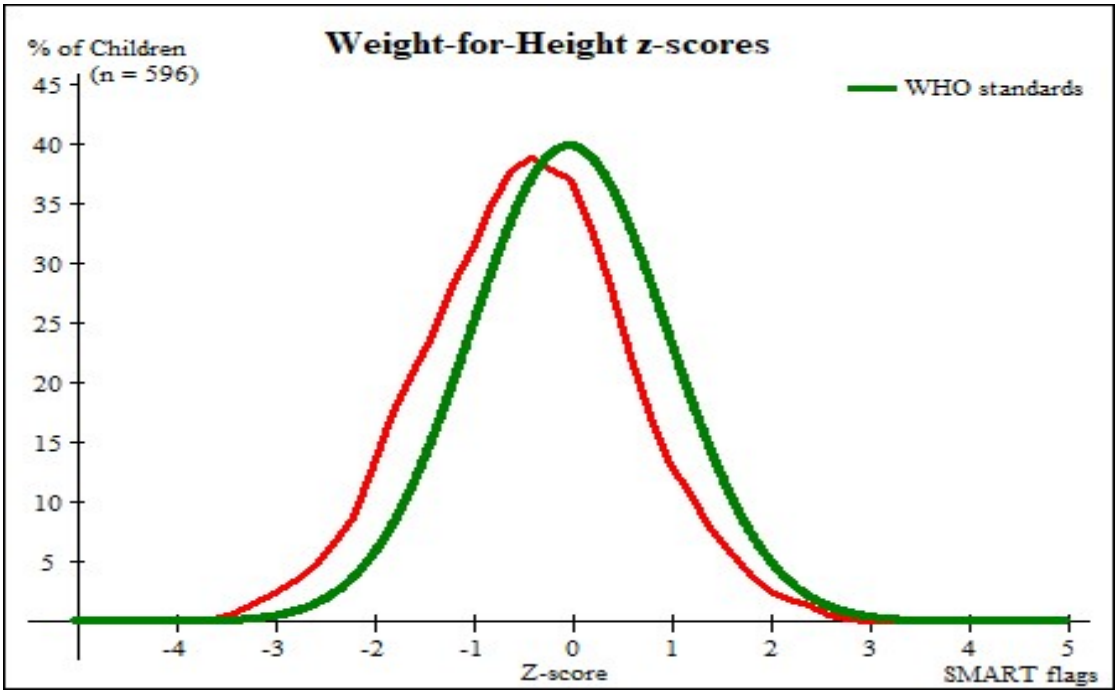
Table 5: Prevalence of acute malnutrition based on weight-for-height z-scores (and/or oedema) and by sex

	All n = 597	**Boys** n = 311	**Girls** n = 286
Prevalence of global malnutrition (<-2 z-score and/or oedema)	(37) 6.2 % (4.4 - 8.7 95% C.I.)	(19) 6.1 % (3.9 - 9.4 95% C.I.)	(18) 6.3 % (4.0 - 9.7 95% C.I.)
Prevalence of moderate malnutrition (<-2 z-score and >=-3 z-score, no oedema)	(33) 5.5 % (3.8 - 8.0 95% C.I.)	(18) 5.8 % (3.6 - 9.1 95% C.I.)	(15) 5.2 % (3.2 - 8.5 95% C.I.)
Prevalence of severe malnutrition (<-3 z-score and/or oedema)	(4) 0.7 % (0.3 - 1.7 95% C.I.)	(1) 0.3 % (0.0 - 2.4 95% C.I.)	(3) 1.0 % (0.3 - 3.1 95% C.I.)

The prevalence of oedema is 0.2 %

In the graphical represenattion of the distribution of weight for hright of the children assessed in figure below, the curve indicates a shift to the left, with a mean deviation of -0.44±1.02 in refernce to the WHO standard curve. This indicates that ocverally, there is poor nutritional status among children in comparison to the reference standards.

Figure 1: Graphical representation of WFH of children assessed compared to reference standards



3.1.3 Analysis of acute malnutrition by Age

A deeper analysis of the nutrition status was conducted to establsish differences in nutrition sttaus among different ages as indictaed in Table 3.3. From the analysis, there were no major differences in nutrition status in younger children aged 6-29months old compared to older children aged 30-59m.

Table 6: Prevalence of acute malnutrition by age, based on weight-for-height z-scores and/or oedema

		Severe wasting (<-3 z-score)		Moderate wasting (>= -3 and <-2 z-score)		Normal (> = -2 z score)		Oedema	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	139	0	0.0	8	5.8	131	94.2	0	0.0
18-29	142	0	0.0	3	2.1	139	97.9	0	0.0
30-41	121	2	1.7	9	7.4	109	90.1	1	0.8
42-53	128	0	0.0	9	7.0	119	93.0	0	0.0
54-59	67	1	1.5	4	6.0	62	92.5	0	0.0
Total	597	3	0.5	33	5.5	560	93.8	1	0.2

3.1.4Analysis of acute malnutrition based on presence od oedema

Presence of bilateral pittijg oedema is a sign of Severe acute malnutrition and analysis was also

done based on this indicator. From the analysis, there was no case of oedema recorded, as clearly indicated in Table 3.4.

Table 7: Distribution of acute malnutrition and oedema based on weight-for-height z-scores

	<-3 z-score	**>=-3 z-score**
Oedema present	Marasmic kwashiorkor. 1 (0.2 %)	Kwashiorkor. 0 (0.0 %)
Oedema absent	Marasmic No. 6 (1.0 %)	Not severely malnourished. 594 (98.8 %)

3.1.5 Prevalence of acute malnutrition based on MUAC

Acute malnutrition can also be diagnosed using the Mid-Upper Arm Circumference (MUAC) given that it is a good indicator of muscle mass and can hence be used as a proxy indicator of wasting. MUAC can be used as a criteria for admission into therapeutic feeding programs both for severe and moderately malnourished children. A MUAC of below 125mm indicates moderate acute malnutrition while a MUAC of below 115mm indicates severe acute malnutrition. An analysis of children aged 6-59 months in Kilifi based on MUAC revealed a GAM of 2.8% (1.8 - 4.5 95% C.I.)and SAM of 0.7% (0.3 - 1.7 95% C.I.) as shown in Table 3.5. From the analysis, there was a significant difference between boys (0.6%) and girls (5.2%).

Table 8: Prevalence of acute malnutrition based on MUAC cut off's (and/or oedema) and by sex

	All n = 603	**Boys** n = 315	**Girls** n = 288
Prevalence of global malnutrition (< 125 mm and/or oedema)	(17) 2.8 % (1.8 - 4.5 95% C.I.)	(2) 0.6 % (0.2 - 2.6 95% C.I.)	(15) 5.2 % (3.1 - 8.5 95% C.I.)
Prevalence of moderate malnutrition (< 125 mm and >= 115 mm, no oedema)	(13) 2.2 % (1.3 - 3.6 95% C.I.)	(2) 0.6 % (0.2 - 2.6 95% C.I.)	(11) 3.8 % (2.1 - 6.7 95% C.I.)
Prevalence of severe malnutrition (< 115 mm and/or oedema)	(4) 0.7 % (0.3 - 1.7 95% C.I.)	(0) 0.0 % (0.0 - 0.0 95% C.I.)	(4) 1.4 % (0.5 - 3.5 95% C.I.)

Prevalence of Underweight based on Weight for Age Z-Score

The World Health Organization defines underweight as low weight compared to the age of a child

relative to National Centre for Health and Statistics or World Health Organization reference median. This survey used the WHO refence stndards for analysis. Underweight can be further categorized into moderate underweight (Weight-for-age <−2 SD and ≥−3 SD of the median) and Severe underweight Weight-for-age <−3 SD of the median). As shown in Table 3.9, the prevalence of underwight among children 6-59months in Kilifi County is 19.8%(15.8 - 24.5 95% C.I.) while severe underweight is at 3.4% (2.1 - 5.3 95% C.I.)

Table 9: Prevalence of underweight based on weight-for-age z-scores by sex

	All n = 597	**Boys** n = 313	**Girls** n = 284
Prevalence of underweight (<-2 z-score)	(118) 19.8 % (15.8 - 24.5 95% C.I.)	(62) 19.8 % (15.7 - 24.6 95% C.I.)	(56) 19.7 % (14.7 - 25.9 95% C.I.)
Prevalence of moderate underweight (<-2 z-score and >=-3 z-score)	(98) 16.4 % (12.9 - 20.7 95% C.I.)	(50) 16.0 % (11.8 - 21.2 95% C.I.)	(48) 16.9 % (12.6 - 22.2 95% C.I.)
Prevalence of severe underweight (<-3 z-score)	(20) 3.4 % (2.1 - 5.3 95% C.I.)	(12) 3.8 % (2.1 - 7.0 95% C.I.)	(8) 2.8 % (1.5 - 5.1 95% C.I.)

Upon further analysis by age, it was evident that more children between 30-59months old were underweight compared to younger children aged 6-29 months as shown in Table 3.10.

Table 10: Prevalence of underweight by age, based on weight-for-age z-scores

		Severe underweight (<-3 z-score)		**Moderate underweight (>= -3 and <-2 z-score)**		**Normal (> = -2 z score)**		**Oedema**	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	137	4	2.9	15	10.9	118	86.1	0	0.0
18-29	142	6	4.2	19	13.4	117	82.4	0	0.0
30-41	121	6	5.0	26	21.5	89	73.6	1	0.8
42-53	130	3	2.3	25	19.2	102	78.5	0	0.0
54-59	67	1	1.5	13	19.4	53	79.1	0	0.0
Total	597	20	3.4	98	16.4	479	80.2	1	0.2

3.1.6 Prevalence of Stunting based on Weight for Height Z-Score

Stunting is defined as low height in comparison to a child's age, and is considered as a form of

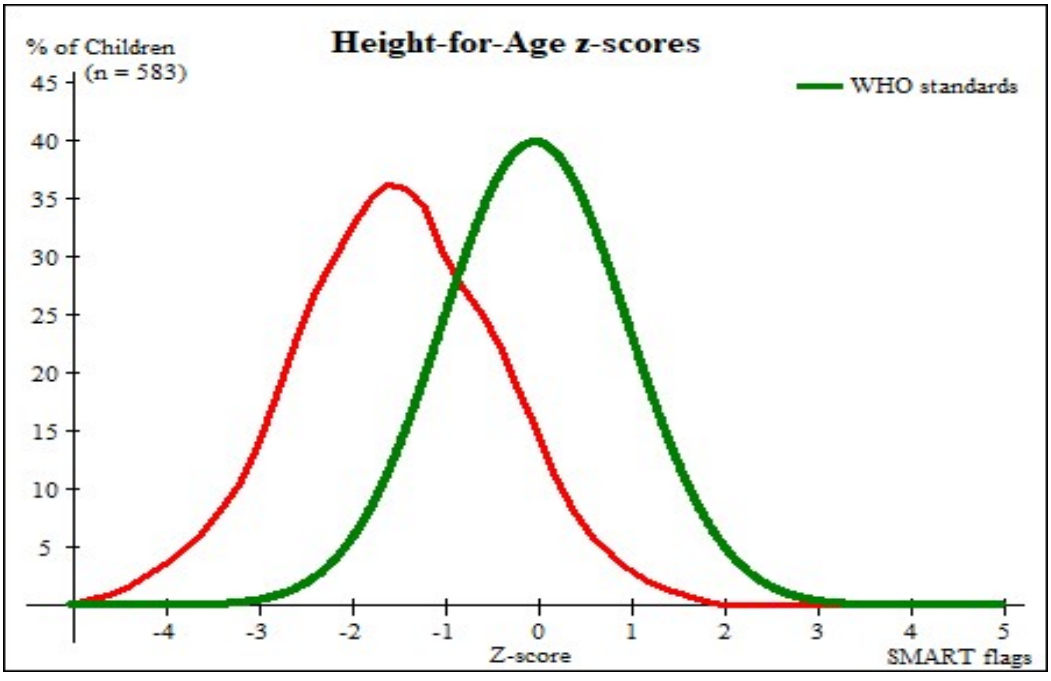
chronic malnutrition manifesting with poor linear growth.It is associated with impaired neuro cognitive development and reduced productivity later in life (WHO, 2013). The analysis of the height for age in children in Kilifi County revelaed a stunting level of 32.2% (27.7 - 37.1 95% C.I.), with severe stunting at 8.7% (6.3 - 11.9 95% C.I.), as indicated in Table 3.11.

Table 11: Prevalence of stunting based on height-for-age z-scores and by sex

	All n = 583	**Boys** n = 303	**Girls** n = 280
Prevalence of stunting (<-2 z-score)	(188) 32.2 % (27.7 - 37.1 95% C.I.)	(99) 32.7 % (27.6 - 38.2 95% C.I.)	(89) 31.8 % (25.2 - 39.2 95% C.I.)
Prevalence of moderate stunting (<-2 z-score and >=-3 z-score)	(137) 23.5 % (20.0 - 27.4 95% C.I.)	(74) 24.4 % (19.9 - 29.6 95% C.I.)	(63) 22.5 % (17.3 - 28.7 95% C.I.)
Prevalence of severe stunting (<-3 z-score)	(51) 8.7 % (6.3 - 11.9 95% C.I.)	(25) 8.3 % (5.8 - 11.7 95% C.I.)	(26) 9.3 % (6.0 - 14.1 95% C.I.)

Figure 2 below shows a graphical representation of the Height for Age for children assessed in comparison to reference children according to WHO standards. The graph shows a shift to the left, indicating that the children surveyed were stunted with a mean deviation of -1.51±1.09 from the WHO standard growth curve.

Figure 1: Graphical representation of HFA among children 6-59m in Kilifi



A further analysis of Height for age among the children was conducted as per the different ages of the children, and as indictaed in Table 3.12, there was no significant difference in stunting levels across the ages. However, it is key to note that there were more severely stunted children in the 18-29 months age category compared to the others.

Table 12: Prevalence of stunting by age based on height-for-age z-scores

		Severe stunting (<-3 z-score)		Moderate stunting (>= -3 and <-2 z-score)		Normal (> = -2 z score)	
Age (mo)	**Total no.**	**No.**	**%**	**No.**	**%**	**No.**	**%**
6-17	130	6	4.6	32	24.6	92	70.8
18-29	139	18	12.9	32	23.0	89	64.0
30-41	121	11	9.1	30	24.8	80	66.1
42-53	127	12	9.4	30	23.6	85	66.9
54-59	66	4	6.1	13	19.7	49	74.2
Total	583	51	8.7	137	23.5	395	67.8

Table 3.15 summarizes on exclusion of z scores for the 3 nutrition indices based on SMART Flags +/-3. The results across all the 3 indices illustrates homogeneity in distribution of malnourished children since design effect was below 2.0. The Standard deviation across the 3 indices was within the range of (0.8-1.2)

Table 13: Mean z-scores, Design Effects and excluded subjects

Indicator	n	Mean z-scores ± SD	Design Effect (z-score < -2)	z-scores not available*	z-scores out of range
Weight-for-Height	596	-0.44±1.02	1.21	3	4
Weight-for-Age	597	-1.14±1.02	1.74	1	5
Height-for-Age	583	-1.51±1.09	1.46	2	18

* contains for WHZ and WAZ the children with edema.

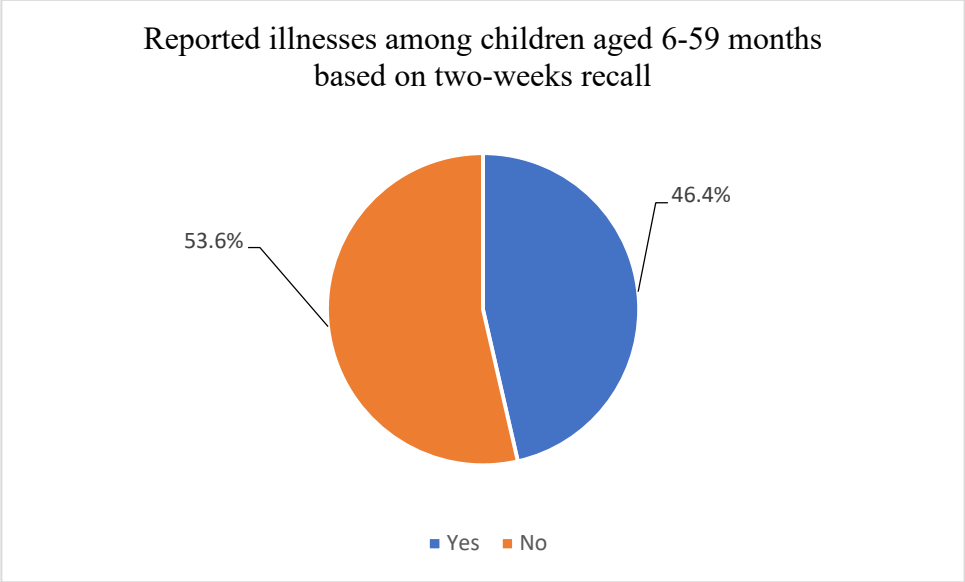
3.2 Child morbidity and Health Seeking Practices

Incidence of disease among children 6-59 months and health seeking behavior

The interplay between malnutrition and infectious diseases establishes a destructive cycle characterized by recurring infections, weakened immunity, and deteriorating nutritional well-

being. Malnourished individuals facing infectious diseases like malaria, diarrhea, measles, ARIs, and HIV/AIDS are at heightened risk of mortality. Such diseases amplify vulnerability to malnutrition, exacerbating immunity decline and intensifying the severity of the diseases themselves.

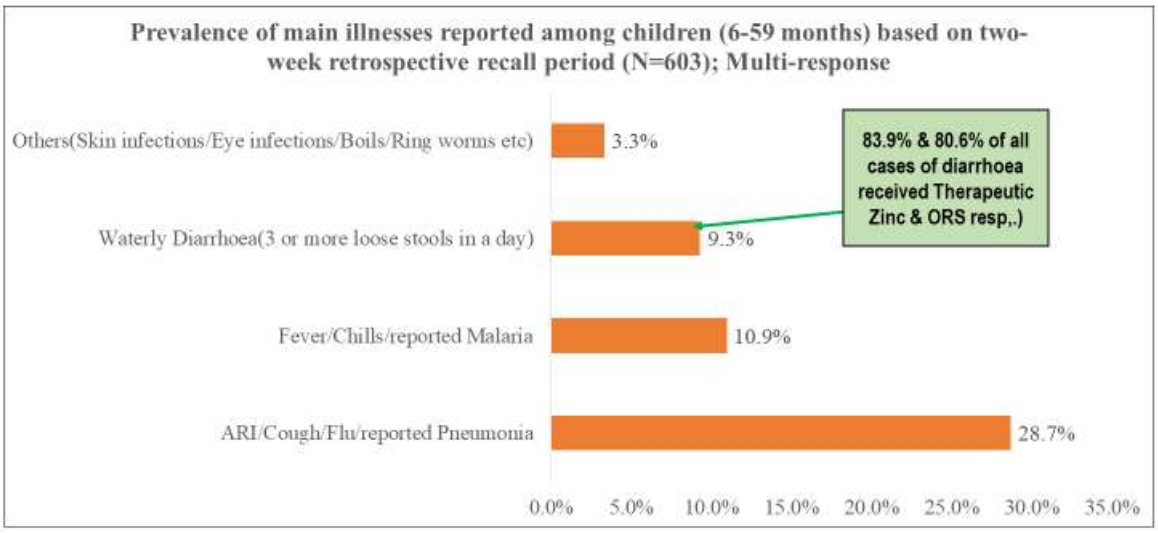
In this survey, the focus was on children aged 6-59 months, assessing disease incidence over the past two weeks. The survey delved into symptoms presented, whether caregivers sought healthcare for their ill child, and if so, where. The surveys outcomes revealed that within the past two weeks, 53.6% of children had experienced illness, with a substantial 86.4% of them having sought medical attention. Among the caregivers, the majority turned to public clinics (64.5%) as their primary choice for seeking healthcare, followed by private clinics (23.1%)



The leading incidence of illnesses was ARI/Cough at 28.7% followed by fever chills/malaria at 10.9% watery diarrhea (three watery stools) stands at 9.3% of which 83.9% and 80.6% of these cases received therapeutic zinc and ORS respectively as reported.

The table below illustrates prevalence of illness and treatment of diarrhoea reported among children 6-59 months based on two-week retrospective recall period.

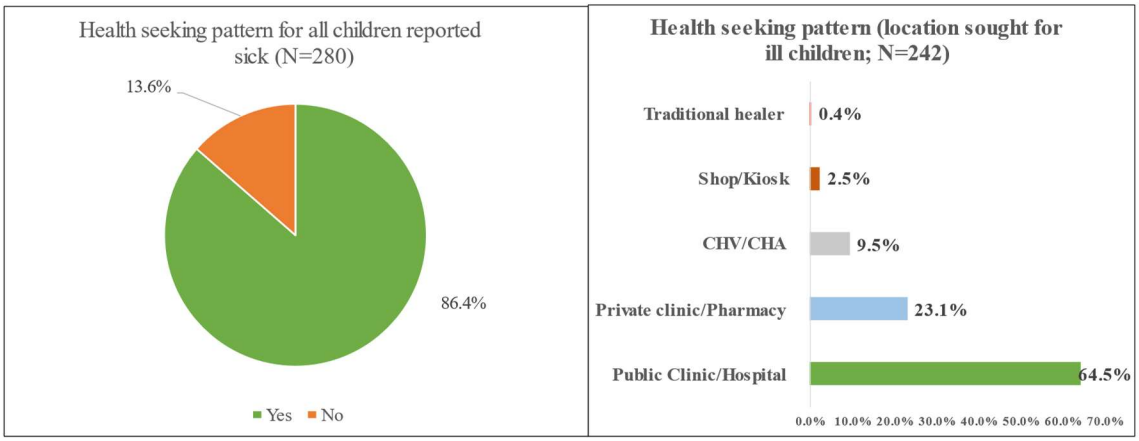
Prevalence of illness and Treatment of diarrhoea



3.3 Health Seeking Behaviour

A large proportion of children (87.6%) who reported to be ill sought treatment from health facilities with the least seeking treatment from traditional healers at 0.4%.

Health Seeking Patterns



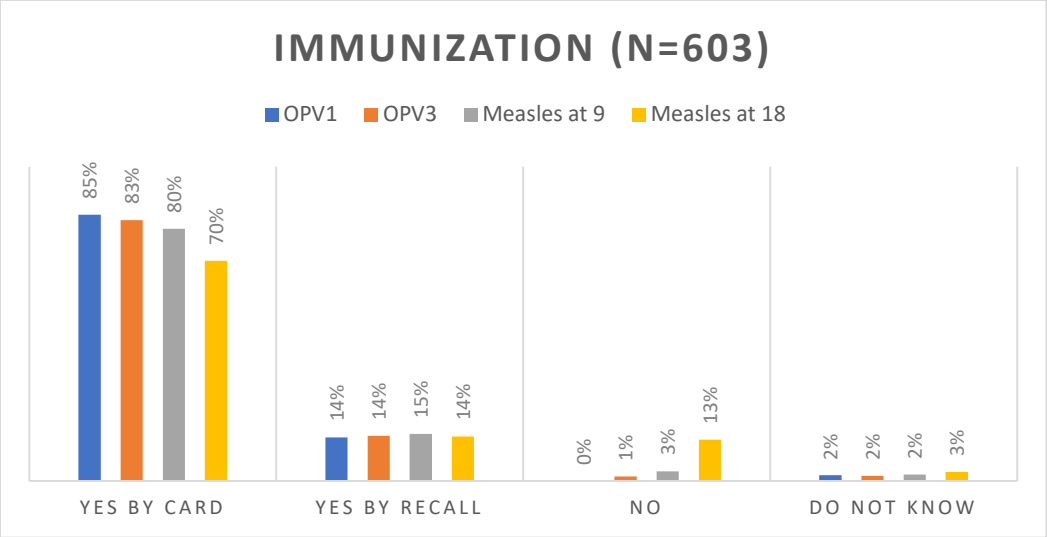
3.4 Child Immunization, Vitamin A Supplementation and Deworming Immunization (BCG, OPV1 and OPV 3) Coverage

Immunization is a vital process wherein an individual's resistance to infectious diseases is bolstered through the administration of vaccines. These vaccines activate the body's own immune system, empowering it to guard against subsequent infections and diseases. The primary goal of immunization is to safeguard them from potentially life-threatening illnesses before exposure occurs.

In pursuit of enhanced immunization coverage, Kenya aimed to achieve 90% coverage among those under the age of one by the conclusion of the second medium-term plan (2013-2017). In Kenya, the ministry of health specifically through the division of vaccines and immunization, orchestrates comprehensive strategies to upscale immunization efforts. This encompasses the expanded programme on immunization (EPI), WHICH INVOLVES VACCINATION service delivery, efficient supply management, impactful awareness campaigns via mass media, and strategic advocacy.

Bacillus Calmette-Guerin (BCG), targeting tuberculosis, yields variable efficacy or protection against TB, ranging from 60% to 80%, spanning a duration of 10 to 15 years. It has demonstrated effectiveness in mitigating the likelihood and severity of miliary TB and TB meningitis, particularly in infants and young children. A remarkable achievement was observed in Kilifi county, where the proportion of children immunized with BCG reached an impressive 99.5%, as evidenced by the presence a scar resulting from vaccination. This accomplishment underscores the county's dedication to ensuring widespread and effective immunization coverage.

		Yes, by card		Yes, by recall		No		Do not know		Card+recall	
	N	n	percent	n	percent	n	percent	n	percent	n	percent
OPV1	603	510	84.6%	83	13.8%	0	0%	10	1.7%	593	98.3%
OPV3	603	500	82.9%	86	14.3%	8	1.3%	9	1.50%	590	97.2%
Measles at 9	571	458	80.2%	85	14.9%	17	2.97%	11	1.90%	543	95.1%
Measles at 18	460	322	70.0%	65	14.1%	60	13.0%	13	2.80%	387	84.1%



3.4.1Vitamin A supplementation and Deworming

Enhancing the vitamin A status of children aged 6-59 months through supplementation has proven to bolster their resistance against diseases, potentially reducing all-cause mortality by around 23%. The assurance of comprehensive supplemtation coverage assumes critical importance, not only in eradicating vitamin A deficiency as a public health concern but also as apivotal component of the child survival agenda. The county's vitamin A coverage falls short of the national target, standing at 41% for children aged 6-59 months who received vitamin A.

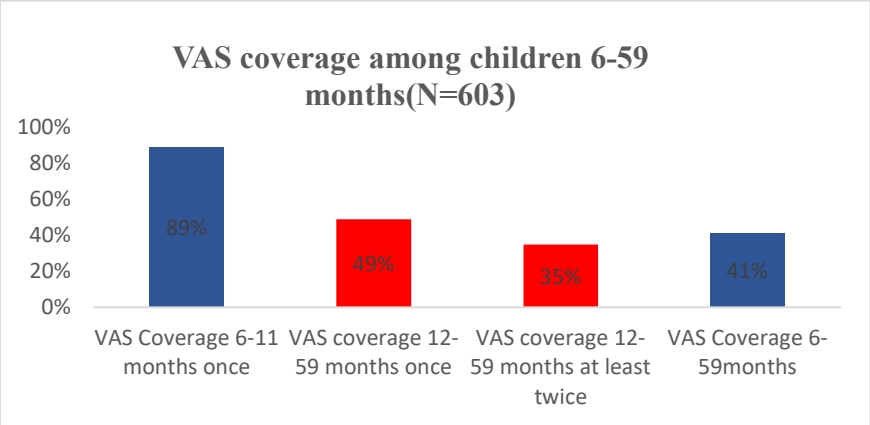
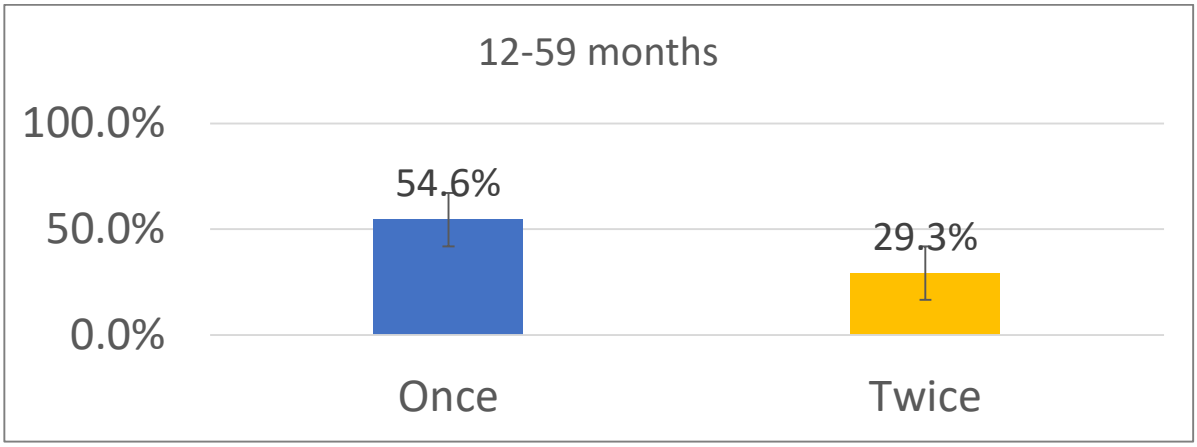


Table 14: vitamin A supplementation status in the County

vitamin A supplementation	6-11m (N=63)		12-59M (N=540)	
	n	percent	n	percent
Once	58	89.0%	263	49.0%
Twice	N/A	N/A	188	35%

3.4.2 Deworming

In total, 54.6 % of children 12- 59 months were dewormed at least once in the past one year, a decrease compared to the previous year's findings. Decrease in deworming could be attributed to supply issues across the County. Among this age group, 29.3% had been dewormed at least twice.



3.5 Food Security

Based on the Long Rains Assessment conducted in July 2023, the food security situation in Kilifi County was classified as Stressed (IPC Phase 2). The key drivers for this were the rainfall performance, pasture, and browse condition regeneration, food prices, distance to water sources, livestock prices.

The LRA indicated that following good to fair rains during the 2023 long rains season, good crop harvest was expected mainly for maize being the staple food. On average, pasture and browse

condition regeneration was good across the livelihood zones. Food commodity prices were also expected to remain stable following long rains harvest expected in the next one month.

Additionally, average distance to water sources for households and livestock, was expected to remain low. Average livestock prices were also expected to remain stable following the good body condition and good harvest expected thus stable supply in the market.

3.6 Minimum Dietary Diversity (24-Hour Recall)-Women

The physiological needs of women make them vulnerable to both nutrition status and food security. It's even more critical during pregnancy and lactation as this can have implication on their foetus and infants.

The main food groups being consumed by women of reproductive age are grains and dark green leafy vegetables at 96% and 58% respectively due to its availability during the rainy season .Assessment of women diversity based on 24 hours recall is as presented in the figure below.

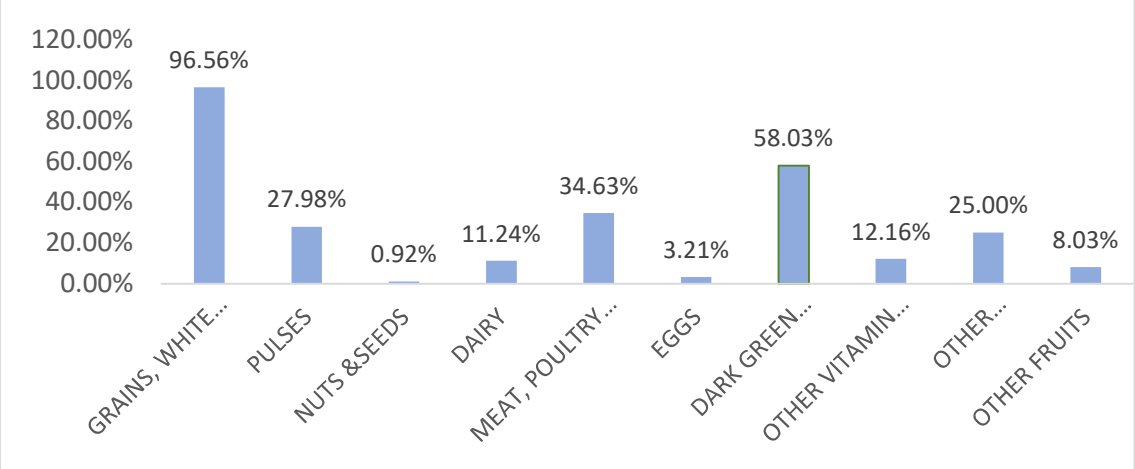


Figure 2**:** Women dietary diversity (24 hours recall)

3.7 Household Dietary Diversity (24-hour Recall)

Household dietary diversity (HDDS) is used as a proxy indicator to measure the socio-economic ability of households to access a variety of foods and food consumption can be triangulated with other food-related information to contribute towards providing a holistic picture of the food and nutrition security status in a community or across a broader area.

The household dietary diversity was assessed using a 24-hour recall period. The figure below illustrates food groups accessed at the household level. Majority of the households (48%) consumed 3-5 food groups while only 25% consumed more than 5food groups.

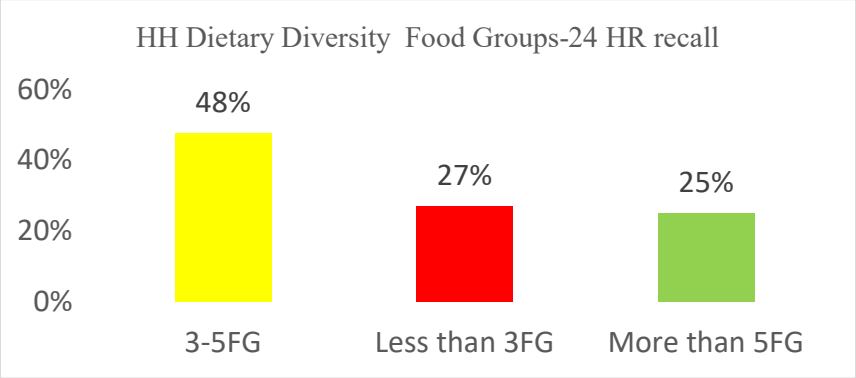


Figure 3**: Household Dietary diversity food groups based on 24-hour Recall.**

As illustrated in the figure below Cereals and vegetables were the highest consumed at 92% and 83% while Fish, tubers, meats and offals were the least consumed at 3%,7%, and 14% respectively .

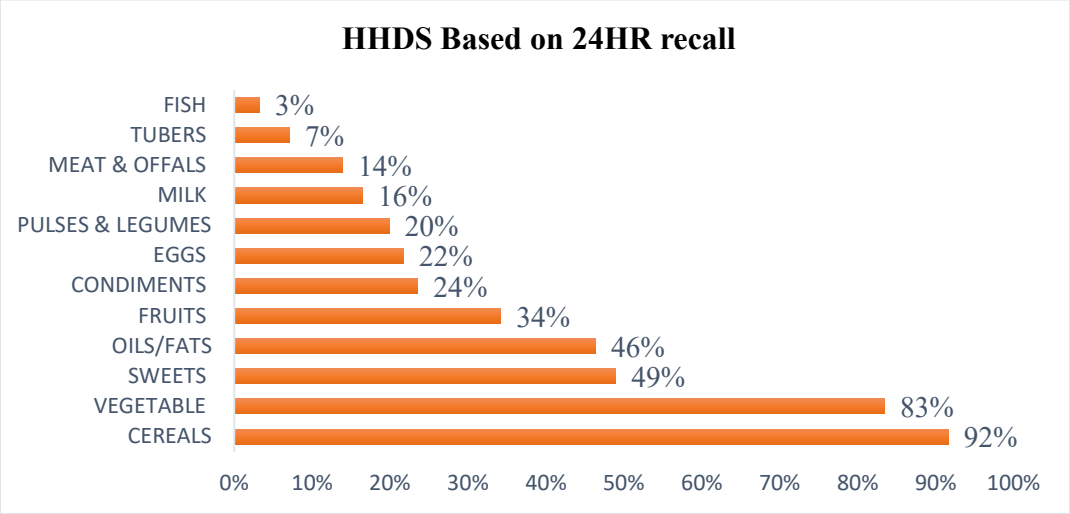


Figure 4**: Household Dietary diversity food groups based on 24-hour Recall.**

3.8 Micronutrients-consumption for Household Dietary Diversity

Analysis of consumption of foods rich or fortified with micronutrients was done based on 7 days recall.

Staples, fruits, and vegetables were the most frequently consumed by households at 91% , and 79% respectively . 71% of households consumed iron rich foods frequently, however ,more than half (55%) of households reported not to be consuming Vitamin A rich foods.

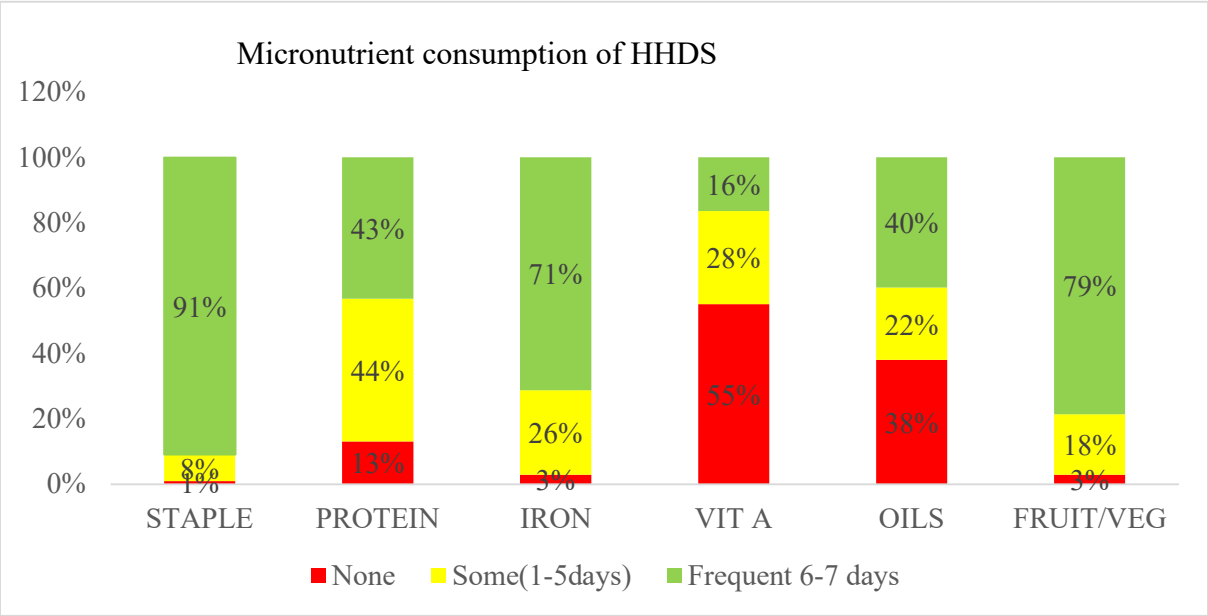


Figure 5**: Micronutrients-consumption for Household Dietary Diversity**

3.8.1 Average days foods are consumed showing consumption of micronutrients.

Analysis Survey results on the average day's food groups are consumed highlighting the consumption of micronutrients showed that Vitamin A rich foods , oils and protein were the least consumed at 2.3%, 3.6% and 4.3% respectively . Vegetables/fruits and staples were the most consumed at 6.9% and 6.7% respectively.

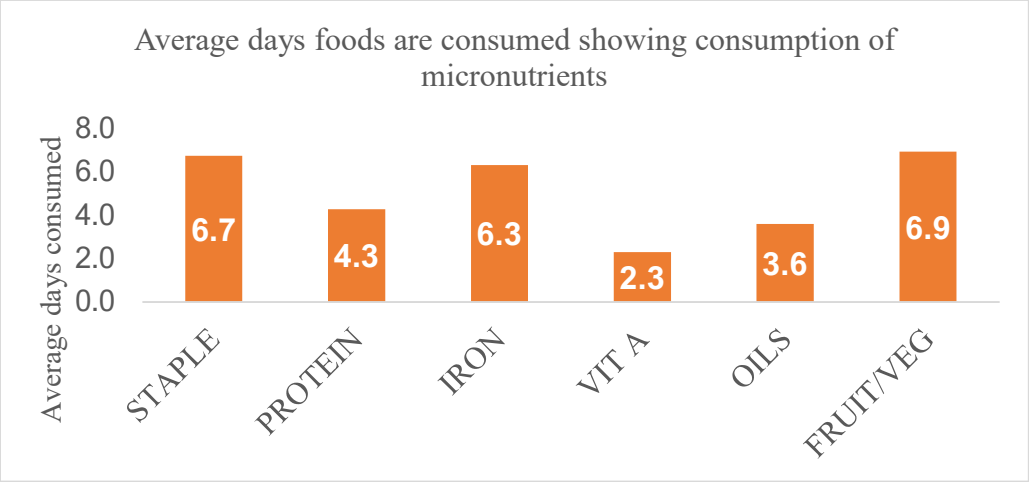


Figure 6**:** Average days of micronutrient rich foods consumption

3.8.2 Food Consumption Score

The food consumption score is an acceptable proxy indicator to measure caloric intake and diet quality at the household level by giving an indication of food security status of the household. It's a composite score based on dietary diversity, food frequency and relative nutritional importance of different food groups.

Majority (95%) of households are within acceptable food consumption score, 4% with borderline and 1% with poor FCS as shown in Table 1.

FCS	HOH	Percent
Acceptable FCS (>35.5)- Good food consumption Cereal, protein, and milk (>5/week), or fruit or vegetable, oil, sugar	615	94.62%
Borderline FCS (21.5-35.0)- Borderline food consumption Cereal, protein, or milk (3-4/week), oil, sugar	26	4.00%
Poor FCS (0-21)- Good food consumption Cereal, protein, and milk (>5/week), or fruit or vegetable, oil, sugar	9	1.38
	650	**100%**

Table 15: Food Consumption Score

3.8.3 Coping strategy Index

Coping strategies are usually indicative of food security challenges and can be used to evaluate the seriousness of food shortages or crises.

The Coping Strategies Index is an indicator of household stress due to a lack of food or money to buy food. The CSI is based on a series of responses (strategies) to a single question: "What do you do when you don't have adequate food, and don't have the money to buy food?" The CSI combines, the frequency of each strategy (how many times was each strategy was adopted) and the severity (how serious is each strategy). This indicator assesses whether there has been a change in the consumption patterns of a given household. For each coping strategy, the frequency score (0 to 7) is multiplied by the universal severity weight. The weighted frequency scores are summed up into one final score.

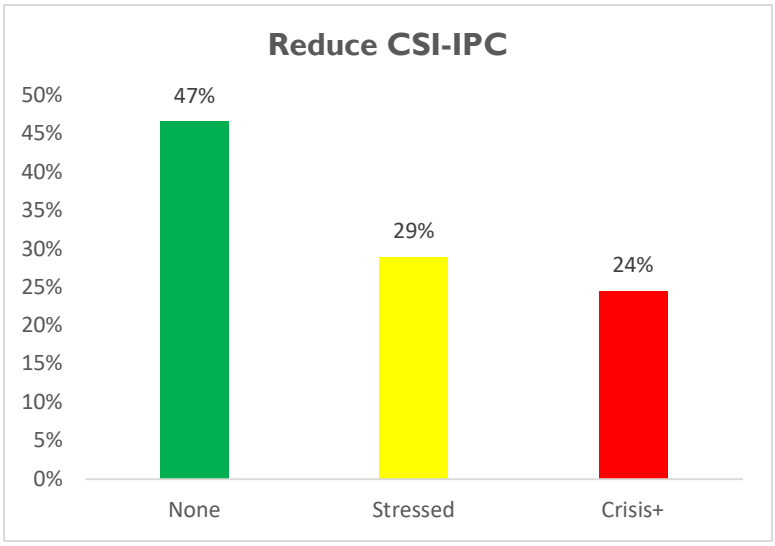
The weighted coping strategy index in the county is at 26.48 with the highest scores being relying on less expensive foods and reducing the number of meals eaten in a day. This value reduced from 32.9 in 2016.

Table 16: Reduced Coping strategy index

	Mean score	Severity score	Weighted
Rely on less preferred and less expensive foods	4.05	1	4.05
Borrow food or rely on help from a friend or relative	2.43	2	4.86
Limit portion size at mealtimes	3.78	1	3.78
Restrict consumption by adults in order for small children to eat	3.23	3	9.69
Reduced number of meals eaten in a day	4.1	1	4.1
Total weighted score			26.48

3.8.4 The Reducing Coping Strategy Index (rCSI

As illustrated in the table and figure below, more than half of the households (53%) reported to be employing a form of coping mechanism. 29% of the households are stressed while another 24% are in crisis.



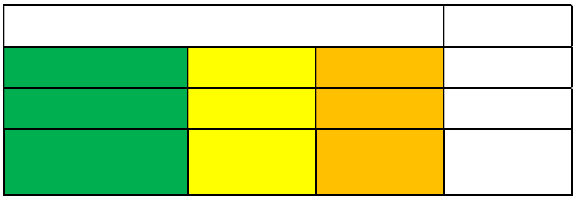
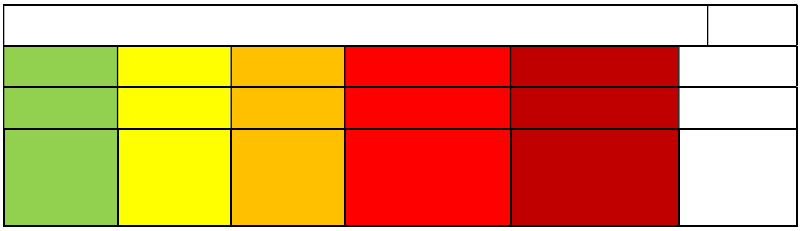


Figure 7: Reduced coping strategy Index.

3.8.5 Household Hunger Scale

Regarding household hunger scale, majority of the households (49.2%) had minimal hunger, 36% were in crisis, 9.8% stressed, 1.5% in emergency and 3.4% in catastrophe .



3.9 Water Hygiene and Sanitation

3.9.1 Overview of Water Hygiene and Sanitation

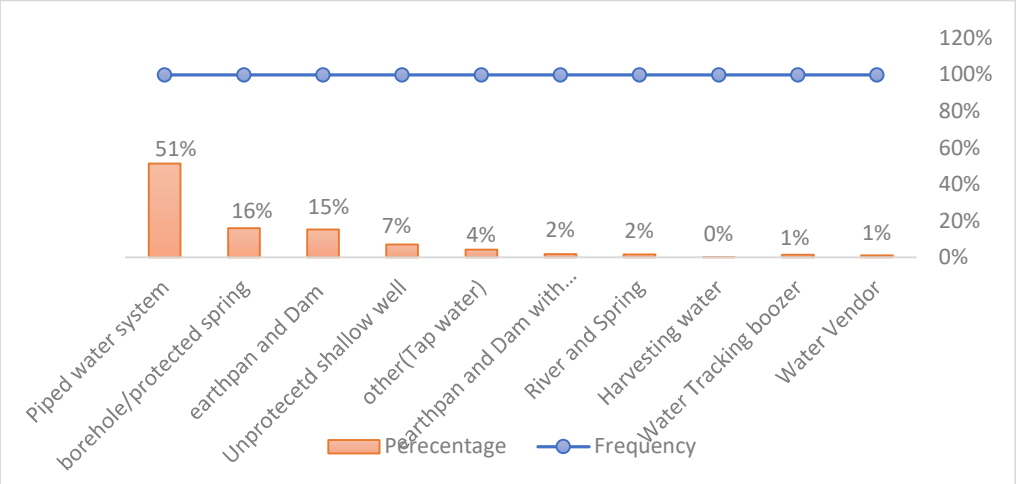
According to the WHO 2023 1global report estimates the global burden of disease associated with unsafe WASH is still significant four health outcomes - diarrhoea, acute respiratory infections, soil-transmitted helminthiases, and undernutrition accounted for most of the attributable burden in 2019, with over one million deaths from diarrhoeal disease and 55 million DALYs. (Disability-adjusted life years). The second largest contributor was acute respiratory infections from inadequate hand hygiene, which was linked to 356 000 deaths and 17 million DALYs. Among children under five, unsafe WASH was responsible for 395 000 deaths and 37 million DALYs, representing 7.6% of all deaths and 7.5% of all DALYs in this age group. This included 273 000 deaths from diarrhoea and 112 000 deaths from acute respiratory infections. These diseases are the top two infectious causes of death for children under five globally. The findings of the UNWater GLAAS 2022 Report in December 2022 2 attribute poor access to safe drinking water, sanitation and hygiene claim millions of lives each year, while the increasing frequency and intensity of climate-related extreme weather events continue to hamper the delivery of safe WASH services.

3.9.2 Main sources of drinking water

The survey indicated piped water system is the main source of drinking water for household consumption in Kilifi county which attributes to 51 %. The proportion of households accessing water from other sources like boreholes and earth pans and dams is at16% and 15% respectively.

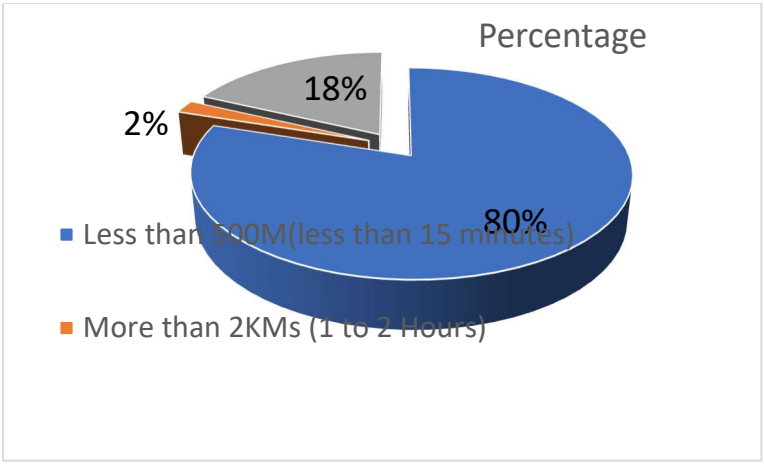
[1] Burden of disease attributable to unsafe drinking-water, sanitation and hygiene: 2019 Report update
[2] UN-WATER GLOBAL ANALYSIS AND ASSESSMENT OF SANITATION AND DRINKING-WATER GLAAS 2022 REPORT

A considerable proportion of households source their water from unprotected shallow wells, river and springs, water boozers and water vendors which reflects 7%, 2%, 1% and 1% respectively.



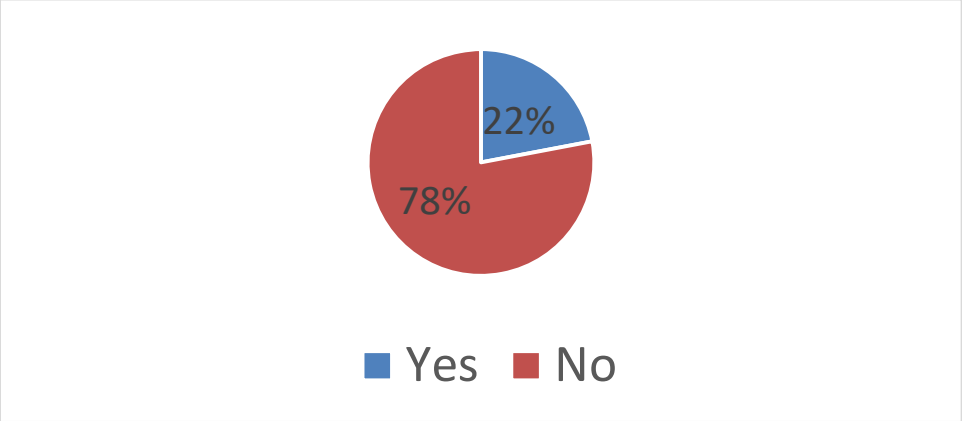
3.9.3 Trekking Distances to the Water Sources

Majority of the households Trek for less than 500m distances to water sources reported by 80% of the households, notably 18 % of households trek for more than 2 kilometers, whereas a small proportion of 2% of the households trek 500 metres to the nearest water source. The most affected by long travels to their primary water sources are mainly those in rural areas who are more likely to cover long distances of up to 5 kilometres to reach their water source due to dependence and more wide spread of natural/ground water that is highly polluted and even unsafe for human consumption.



3.9.4 Queuing for water

Households queueing for water stand at 78% from the survey conducted due to water scarcity as a result of the current drought. Households experience usual or occasional ques to acquire water from their primary source. The scenarios are more common in peri urban set ups. According to United Nations 2019, The Sustainable Development Goals Report, the Goal 6, target 6.4 relates to water use and scarcity, where it illustrates that: "By 2030, substantially increasing water-use efficiency across all sectors and ensuring the sustainable withdrawals and supply of fresh water in order to address water scarcity and substantially reduce the number of people affected by water scarcity.

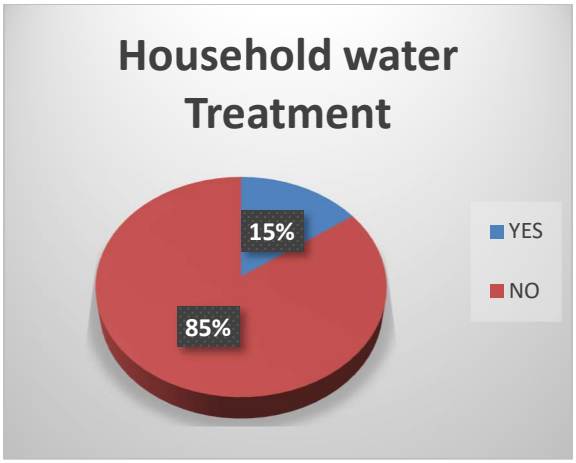


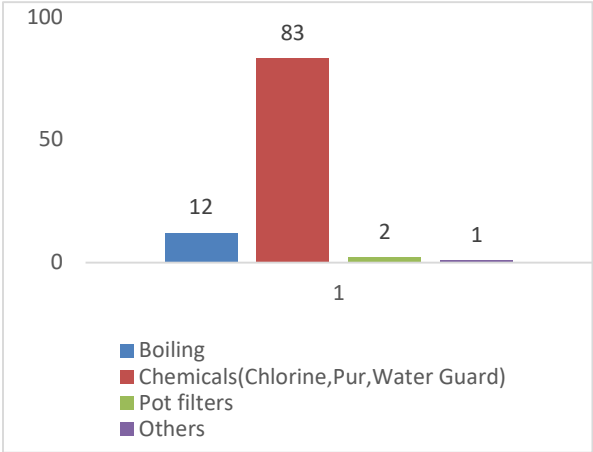
3.9.5 Water Treatment

According to the WHO guideline 2022 3recommends household water treatment and safe storage as a significant public health intervention that aims at improving the quality of drinking unsafe or unreliable piped water supplies. Further, adoption of preventive measures that ensure water Safety is key in reducing diarrhoeal diseases emanating from use of contaminated water. Majority of the households that account to 85% reportedly don't treat their water with a small proportion of 15% of households that were reported to be treating water for drinking. Consistent analysis across the methods of water treatment indicate (83%) used water treatment chemicals as a method of treatment, with a significant proportion using the boiling and pot filter as their preferred method at 12% and 2% respectively.

[3] Guidelines for drinking-water quality: Fourth edition incorporating the first and second addenda-WHO-March 2022.

[4] The Sustainable Development Goals Report,





3.9.6 Household Per capita Water Consumption

Per capita water consumption 275 17.61litres/person/day which is above the minimum standards of 15litres/person/day. The proportion of households meeting the minimum standards of per capita consumption was 87%.

3.10 Sanitation

3.10.1 Handwashing facilities

UNICEF attributes good hand hygiene as a cornerstone of safe and effective health care. It considers it as a highly cost-effective public health measure that is also crucial to protecting against a range of diseases like pneumonia and diarrhoea. According to them 2.3 billion people do not have a handwashing facility with water and soap at home. The survey findings showed 58% of the households had fixed handwashing facilities while 25% did not have handwashing facilities at all.

Additionally among those practicing handwashing,49% were using detergents to wash hands while 51% do not use any detergents.

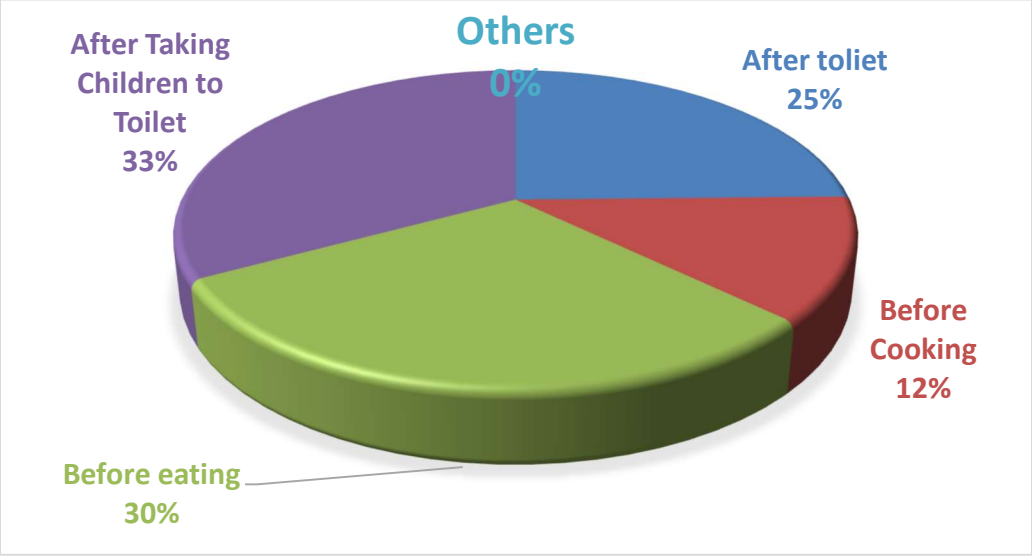
3.10.2 Awareness on Handwashing

The practice of effective hand hygiene, in health care and in community settings, is critical to infection prevention. It is a key component of SDG 6, While the role of hand hygiene in public health has long been acknowledged, This simple practice can reduce the burden of infectious diseases and, by extension, improve other health outcomes. [1]. 97% of the households were aware on the handwashing instances. While 3% did not have any awareness pertaining to the instances an individual is supposed to wash hands.

	Frequency	Percentage
Yes	628	97%
No	22	3%
	650	100%

3.10.3 Handwashing instances

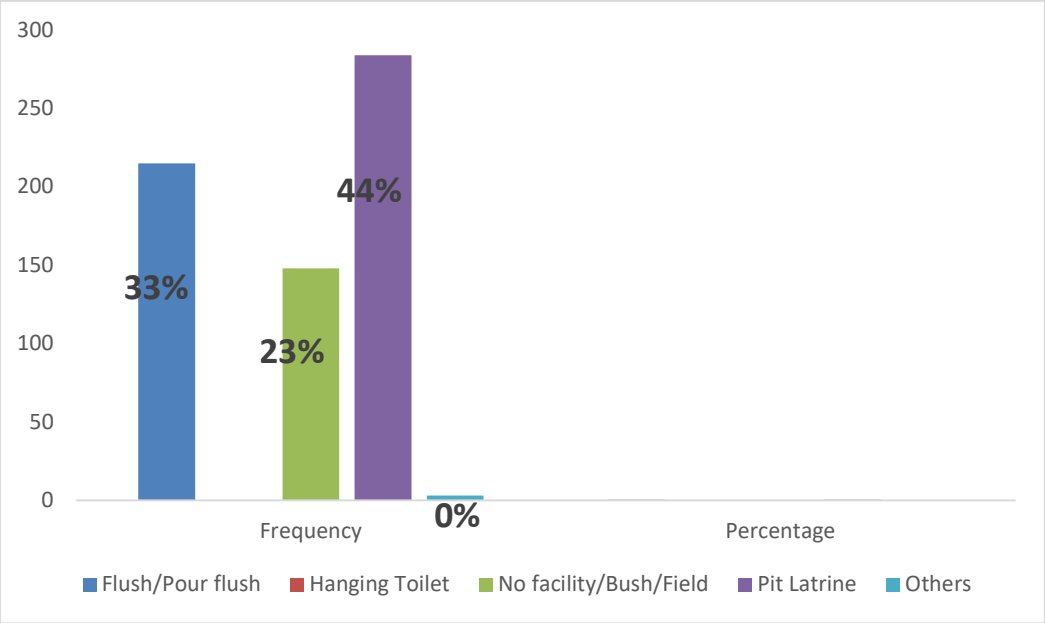
WHO recommends five critical moments a person is required to wash hands, they include, Before, during, and after preparing food, before and after eating food, after using the toilet, after changing diapers or cleaning up a child who has used the toilet. Majority of the households reported to wash hands after taking children to the toilet, before eating and after visiting the toilet at 33%,30% and 25% respectively.



3.10.4 Household Reliving Point

44% of the households were using pit latrines for relieving themselves while 33% were those who used pour flush latrines and 23% did not have toilets, and are still defecating in the open. Efforts to end open defecation by 2024 will need to be significantly increased. CLTS activities need to be scaled up to promote community behaviour change to achieve SDG 6.2 to end open defecation in the county. According to the Kilifi county Sanitation road map it is expected that by 2024, Kilifi

County will be declared open defecation-free with an increase of between 70 per cent and 80 per cent in toilet coverage and handwashing.



3.10.5 Type of Pit Latrines

Amongst the households who were using pit latrines, 153 households had pits with slabs while 93 households had pits without slabs and 35 households had ventilated improved pit latrines.

CONCLUSION

The county has very high stunting levels at 32.2%. This is however an improvement compared to KDHS 2022 which showed a stunting level of 37% as well as KDHS 2014 which revealed a stunting level of 39.1%.

The survey also revealed a GAM level of 6.2%, which indicates that the county is currently at "Alert" (IPC AMN Phase 2). This is an improvement compared to KDHS (2022) which showed a GAM of 7.2%. Compared to the previous surveys over the years, the levels of acute malnutrition in the county have increased since GAM levels have been mostly below 5% (Acceptable levels). This may be attributed to the increased food insecurity in the county owing to 5 failed rain seasons as well as sub optimal infant feeding practices.

Another factor that contrbutes to the nutrition status is morbidity, and the survey revealed high morbidity where 46.9% of children 6-59 months were reported to have been ill in the two weeks preceding the survey. 9.3% of the children had diarrhoea, 10.9% had fever and chills associated with malaria and 28.7% had Acute Respiratory infections. Twice Vitamin A supplementation and Deworming among children 6-59m was 41% and 29.3% respectively, indictaing very low coverage. This indictaes that the immunity of many children in the county is low, and corresponds positively with the high morbidity rate among the children.

A large proportion of households in Kilifi County experienced food insecurity as 55% the households reported to have employed a coping mechanism of household food shortage. In addition, only 7.75% of women of reproductive age achieved the minimum dietary divesity while only 25% of households consumed more than 5 food groups the previous day. This may be attributed to the poor food security status due to numerous failed seasons.

4.57% of women of reproductive age were malnourished with a MUAC of less than 21.0cm, and dietary diversity was very low among women. This has increased from 1.8% in 2016, indicating that the levels of malnutrition may have increased among WRA due to rising food insecurity. WRAs mostly consumed grains and vegetables but hardly consumed nuts and eggs, therefore more awareness needs to created on the importance of different food groups to health and nutrition status.

A majority of caregivers (97%) were aware of handwashign instances, however, only 58% had fixed handwashign facilities and only 49% were using soap and water to wash their hands. 44% of households owned pit latrines and 33% used our-flush toilets. 23% of the households did not have any sanitation facility and were using the bushes as a relieving point.

The main drivers of acute malnutrition in the county therefore include poor dietary intake, high morbidity due to low immunity, sub-optimal infant feeding practices and food insecurity. Other key contributors may be the poor sanitation status and therefore more awareness needs to be created to improve these indicators.

RECOMMENDATIONS

SURVEY FINDINGS	SHORT TERM RECOMMENDATIONS	MEDIUM TO LONG TERM	RESPONSIBLE
SECTOR: HEALTH AND NUTRITION			
GAM prevalence of 6.2% High underweight prevalence at 19.8% Very High stunting prevalence at 32.2%	**Short term** • Scale up malnutrition screening through integrated outreaches, mass screening, Family MUAC • Integrated outreaches to reach population not covered by health facilities • Training of health workers on the new IMAM guideline and OJT of staff on the same • Strengthen monitoring of nutrition programming through joint supportive supervision, conducting of DQA at the health facilities for improved quality • Implementation of nutrition surveillance through roll out of IMAM surge to track the nutrition status at the community for better response	**Long term** • Re-Establish multisectoral collaboration for nutrition sensitive programming • Enhance nutrition surveillance	CNC, through DOA
33.6% MDD, 24.1% MAD for children 6-23m	-Training of Healthcare workers on MIYCN and BFCI to improve capacity on MIYCN -Strengthen BFHI in the 9 big facilities in the county -Incorporate SBCC strategies in MIYCN interventions	-Scale up BFCI to Kilifi South, Kilifi North, Malindi and Rabai - Strengthen multisectoral collaboration to improve household dietary diversity	CNC, DCS, PARTNERS
Vitamin A Supplementation for children 6-59m (twice) at 41% and 6-11m	• Integrate Vitamin A supplementation and deworming during community activities like outreaches, mass	Multisectoral collaboration with MOE to work out a VAS strategy for ECDE children	DOH, PARTNERS

at 89% deworming coverage at 29.3%.	screening, health action days • Dissemination of Vitamin A strategies/guides to the health managers and workers • Strengthen routine supplementation by ensuring health workers take opportunities for VAS supplementation and deworm children coming to health facilties.		
IFAS utilization for >90 days at 84.7%	Short term • Strengthen SBCC for uptake of iron folate at the community level by CHVs • Conduct community level screening for malnutrition targeting PLW through mass screening and routine community screening		CNC, CCHSFP
SECTOR: WATER, HYGIENE AND SANITATION			
Households queueing for water for more than one hour reduced from 26.7% in 2016 to 15% in 2023	Short term • Solarization of boreholes to reduce fuel cost and ensure more working hours for increased water output. • Rehabilitation of broken down boreholes • Support Rapid Response teams to repair and maintain boreholes due to long working hours • Support setting up roof water catchment water storage tanks to the institutions like schools and health facilities • Connect the institutions like schools and health facilities with water from	Long term • Install water meters to the boreholes to ensure accountability and sustainable use of water resources • Drilling of more boreholes • Construction of more water pans •	-DOW

	nearby boreholes and other water sources • Support with first moving parts for borehole repair and rehabilitations		
Household water treatment at only 15%	• Procure and distribute water treatment chemicals • Hygiene promotion on the importance of consumption of treated water.	• Institute policy to promote rain water harvesting to improve access to safe water	DOH (WASH)
Latrine access at 77%. High open defecation at 23%.	• Sanitation promotion at the community • Scaling up of CLTS at the village	• N/A	DOH (WASH)
SECTOR: FOOD SECURITY AND LIVELIHOOD			
Household dietary diversity (consuming 3-5 food groups) at 25% There was a decline in the number of women consuming more than five food groups from	Short term • Promotion of kitchen garden using new farming technologies that conserve water • Scale up of cash transfers to the vulnerable communities • Health education to community members on dietary diversity and	Long-term • Set up irrigation farms for access to vegetable at household and for the market. • Multisectoral efforts to improve livelihoods of populations through setting up of of industries using raw materials	-DOA, DOH

39.2% in 2016 to 7.79% in 2023. Households with low consumption of eggs, Vitamin A rich foods Proportion of households within acceptable food consumption score at 94%	preparation of quality diets • Support implementation of BFCI for adaptation of good feeding practices • Set up kitchen garden around water sources like boreholes, seasonal rivers and water pans • Nutrition promotion on the need for the consumption of iron and vitamin A rich vegetables and fruits. • Implementation of cash transfers.	from within the county e.g. coconut oil plant. Pineapple plant- through Ministry of Trade	

APPENDICES

APPENDIX I: Kilifi County SMART SURVEY Training Timetable

Day 1 Agenda: Wednesday, 21st June 2023				
Schedule/time	**Content of presentations**	**Details**	**Facilitator**	**Training materials/Practica Training Package**
8.00-8:30AM	Arrival, Registration and Climate setting	Survey teams registered	**All Coordinators**	Registration forms
8:30-9:45 AM	**Session 1:** Overview of nutrition survey and Methodology	Opening Remarks Rationale survey objectives, methodology.	Angella	Training time tables, PowerPo
9.45- 10:15 AM	**Session 2:** Survey team	SURVEY TEAMS: Roles and responsibilities	Mbunya	PowerPoint
10:15-10:30 AM	**NUTRITION BREAK**			
10:30-11:00 AM	**Session 3: Household** Definition and Random Sampling		Jardine	PowerPoint
11:00-12:00 AM	**Session 4:** Simple random sampling and Segmentation		Jardine	PowerPoint
12:00-12:45 AM	**Session 5**: Malnutrition	Definition, assessment and types of malnutrition	Nyawa	PowerPoint
12:45-1:45 PM	**NUTRITION BREAK**			
1:45-2:15 PM	**Session 6 A**: Anthropometry	Body measurements- Weight	Mbunya	Weighing scales- Bathroom. Known Weights, PowerPoint
2:15- 2.45 PM	**Session 6 B**: Anthropometry	Body measurements- height and length	Angella	Height/Length boards, Power
2:45-3:15 PM	**Session 6 C:** Anthropometry contd.	**Body measurements- MUAC**	Ibrahim	MUAC tapes/string, PowerPo
3:15-4:15 PM	**Session 6 D**: Anthropometry contd.	**Body measurements - Oedema**	Ibrahim	PowerPoint
4:15-430 PM	Review and feedback-			
4:30 PM	**Day end**			

Day 2 Agenda: Thursday 22nd June 2023

Schedule/time	Content of presentations	Details	Facilitator	Training materials/Practical to Training Package
8.00-8:15 AM	Recap.	**Review/highlights of previous day**		
8:15-8:45 AM	**Session 6 E**: Anthropometry contd.	Age determination and use of calendar of events	Jardine	Calendar of events; mother child
8:45-9:30 AM	Anthropometry Cont.	Review of calendar of events-group discussions.	Jardine	Template of Calendar of events,
9:30-10:00 AM	**Session 7:** Quality checks of anthropometric measurements	Data Quality check/Plausibility report	Kevin Mutegi	Plausibility checks reports. ENA- SOFTWARE, PowerPoint
10.00-10.30 AM	**Session 8**: Anthropometric - Survey Questionnaire	Introduction into questionnaire and use of ODK	Norman Wanyawa	Tablet with the survey questionn
10:30-10:45 AM	**NUTRITION BREAK**			
10.30-12.00 Noon	Anthro& HH-Survey Questionnaire	Child health and nutrition	Angella	Tablet with the survey questionn
12.00-12:30 PM	Anthro& HH-Survey Questionnaire	IYCF	Nyawa	Tablet with the survey questionn
12.30-1:00 PM	Anthro& HH-Survey Questionnaire	Household demographics/Maternal Nutrition- WRA	Mary	Tablet with the survey questionn
1:00-2:00PM	**NUTRITION BREAK**			
2.00-3.15 PM	Anthro &Household-Survey Questionnaire	**WASH**	Erasto	Tablet with the survey questionn
3:15 -3:30 PM	Anthro& Household -Survey Questionnaire	Food security and consumption /Maternal dietary diversity/CSI	Mbunya	Tablet with the survey questionn
3.30- 4:00 PM	Anthro &Household-survey questionnaire.	Mortality	Kevin	Tablet with the survey questionn
4:15- 4:45 PM	Uploading of questionnaire.	Saving and uploading of questionnaires	Norman	Tablet with the survey questionn
4.45-5:10 PM	Anthro &HH survey questionnaire	Role play		Tablet with the survey questionn
5:10pm	**DAY BREAK**			

Day 3 Agenda: Friday 23rd June 2023				
Schedule/time	**Content of presentations**	**Details**	**Facilitator**	Training materials/Practical tool Package
8.00-8:30 AM	Recap.	Review/highlights of previous day		
8:30 -8:45 AM	**Session 9:** Standardization	**Theory**		PowerPoint, Standardization she
8:45-9:00	**NUTRITION BREAK**			
9.00-1:00 PM	Standardization-1st & 2nd round	Practical	**Erasto, Kevin**	Standardization sheets Mothers and children/ anthropor
2:00-3:00 PM	**NUTRITION BREAK**			
3:00-4:30 PM	Recap.	Review/highlights of previous day		
4:30PM	**DAY BREAK**			
Day 4 Agenda: Saturday, 24th June 2023				
8:00-8:45 AM	Standardization –feedback			Standardization –feedback
	Session 10: Special cases-discussion		Mry Katuto	PowerPoint
	Field/Pre-test procedures			Tablets/phone Survey questionnaire
	Pre-test Data Analysis feedback	**Provide pre-test data quality feedback**	Kevin	Pre-test Data Analysis feedback
	Movement plans and logistics		Angella	
	Collection of tools, equipment and materials		Team Leads	
12:00-1:00 PM	**NUTRITION BREAK and Field Departure**			

APPENDIX II: SURVEY TEAM

KILIFI COUNTY SURVEY TEAM		
	Team Leaders	**Enumerators**
1	Mgalla Mvurya	Emily Mwango
		Hamisi Mwahui
2	Erasto Mwanganyi	Delilah Vunzu
		Frank Kingi
3	Mercy Pendo	Aurelia Kasudi
		Janet Mkamba
4	Beatrice Karisa	Fenny Chondo
		Tamasha Mbodze
5	Bibi Abdhalla	Japheth Obura
		Rachael Masha
6	Grace Mwasho	Nuru Nyanya
		Salome Kazungu
7	Addah Mwemba	Harriet Zawadi
		Esther Mutheu
8	Geoffrey Katana	Elizabeth Mjeni
		Philister Mturi
9	Anna Mwamuye	Dennis Baya
		Damaris Agango

SURVEY SUPERVISION

	ZONE COORDINATORS	TEAMS	OVERALL COORDINATORS
1	**Nyawa Benzadze-**Zone coordinator : Suppport supervisors- Norman,Clement ,Valery &Zahra, Kevin Mutegi	Team 1-4	1. **Angella Wali**-CNC 2. **Rachael Juma**- County Health Records Office
2	**Ronald Mbunya**-Zone coordinator- Cynthia, Abdi, Florence,Ruth, Mary Katuto	Team 5-9	

APPENDIX III: SAMPLED CLUSTERS

COUNTY	SUB COUNTY	WARD	LOCATION	SUB LOCATION	VILLAGE
Kilifi	Ganze	JARIBUNI	KAUMA	MDANGARANI 10	SOSOMAKUMBA
Kilifi	Ganze	JARIBUNI	PALAKUMI/MIGUMOMIRI 79	VITSAPUNI 79	GAREHENI
Kilifi	Ganze	GANZE	GANZE	TSANGALAWENI	MIDZI MITSANO
Kilifi	Ganze	BAMBA	MTSARA WA TSATSU	CHIRA	Keresa
Kilifi	Ganze	BAMBA	BAMBA	PAZIANI	Mkuhamure
Kilifi	Ganze	SOKOKE	VITENGENI	MADAMANI	Madamani
Kilifi	Ganze	SOKOKE	MAHERA	MWANGEA 104	KISIWANI
Kilifi	Kaloleni	Kayafungo	Tsangatsini	Tsangatsini	Bwaga
Kilifi	Kaloleni	Kayafungo	Kayafungo	Mbalamweni	Mwanda
Kilifi	Kaloleni	mwanamwinga	Mwanamwinga	Kithengwani	Madziachenda
Kilifi	Kaloleni	Mariakani	Mariakani	Mariakani Mtangoni	Shangia
Kilifi	Kaloleni	Mariakani	Mariakani	Mariakani Mtangoni	Jakaba A
Kilifi	Kaloleni	Mariakani	Mariakani	Kawala Kadzonzo	Kabororini
Kilifi	Kaloleni	Kaloleni	Chanagande	Chalani Mihingoni	Kakwakwani
Kilifi	Kaloleni	Kaloleni	Kaloleni	Kinani Makomboani	Makomboani B
Kilifi	Kilifi North	KIBARANI	Mtondia	Kibarani	Misufini
Kilifi	Kilifi North	KIBARANI	Mtondia	Konjora	Mtsanganyiko
Kilifi	Kilifi North	TEZO	Mtondia	Mtondia	Mtondia
Kilifi	Kilifi North	MNARANI	Mnarani	Mnarani	Makonde
Kilifi	Kilifi North	SOKONI	Township	Mnarani	Mtaani Sokoni
Kilifi	Kilifi North	SOKONI	Township	Sokoni	Kisumu Ndogo
Kilifi	Kilifi North	SOKONI	Township	Hospital	Old Ferry
Kilifi	Kilifi North	WATAMU	Watamu	ROKA MAWENI	Haidar
Kilifi	Kilifi North	DABASO	Dabaso	Timboni	Mabuani C

Kilifi	Kilifi North	MATSANGONI	Matsangoni	Mbaraka chembe	Kabelengani A
Kilifi	Kilifi South	Chasimba	Chasimba	Kitsoeni	Dzitsoni
Kilifi	Kilifi South	Mwarakaya	Bandarasalama	Mwembekati	Kidutani/Mafisini
Kilifi	Kilifi South	Junju	Junju	Kuruwitu	Timboni
Kilifi	Kilifi south	Shimo latewa	Mtwapa	Shimo la tewa	Goa
Kilifi	Kilifi south	Shimo latewa	Mtwapa	Shimo la tewa	Mikanjuni
Kilifi	Kilifi south	Shimo latewa	Mtwapa	Shimo la tewa	Sokoni
Kilifi	Kilifi south	Shimo latewa	Mtwapa	Shimo la tewa	Be Charo Yaa
Kilifi	Kilifi south	Shimo latewa	Mtwapa	Shimo la tewa	Mwavitswa
Kilifi	Kilifi south	Mtepeni	Mtwapa	Kanamai	Mwatundo D
KILIFI.	MAGARINI	GARASHI	DAGAMRA	BATE	Bate B
KILIFI.	MAGARINI	ADU	MARERENI	MARERENI	KIKWATANI
KILIFI.	MAGARINI	ADU	ADU	RAMADA	BORA IMANI
KILIFI.	MAGARINI	MAGARINI	MAGARINI	MAMBRUI	Sabaki
KILIFI.	MAGARINI	MAGARINI	MAGARINI	MARIKEBUNI	Masheheni A
KILIFI.	MAGARINI	GONGONI	GONGONI	SHOMELA	kazaheni
KILIFI.	MAGARINI	SABAKI	MALINDI TOWN	SABAKI	Dingwini
KILIFI.	MAGARINI	MARAFA	CHAMARI	CHAMARI	Kilulu
Kilifi	Malindi	Malindi Town ward	Malindi	Barani	Mbuyu wa kusema A
Kilifi	Malindi	Malindi Town ward	Malindi	Barani	Barani Town C
Kilifi	Malindi	Malindi Town ward	Malindi	Central	Mkondoni B
Kilifi	Malindi	Shella	Malindi town	Shella	KAJAJINI D
Kilifi	Malindi	Shella	Malindi town	Shella	MUYEYE TOWN A
Kilifi	Malindi	Shella	Malindi town	Shella	SANTA FEE B
Kilifi	Malindi	Shella	Malindi town	Shella	Maweni M
Kilifi	Malindi	Ganda	Ganda	Mere	MARULA B
Kilifi	Rabai	Rabai/Kitsurutini		Buni Kisimani	Pwani Kisirwani
Kilifi	Rabai	Kambe/Ribe		Mbwaka	Mwiri
Kilifi	Rabai	Mwawesa		Mikahani	Bedida